THE DUTCH DISEASE EFFECTS OF REMITTANCES IN NIGERIA

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Declaration

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This dissertation includes three original papers published in peer-reviewed journals. The development and writing of the papers (published and unpublished) were the principal responsibility of myself and, for each of the papers where this is not the case, a declaration is included in the dissertation indicating the nature and extent of the contributions of co-authors.

A.O. Adejumo

Date: December 2018

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‘Now unto the King eternal, immortal, invisible, the only wise God, be honour and glory for ever and ever. Amen’ (I Timothy 1:17). I offer my profound praise to the Almighty God for the endless supply of grace, strength that exceeds my needs, and light that shines in my dark hours. The Lord deserves all my praise for crowning my efforts with success.

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Abstract

Remittances have been a major source of economic support for dependants of migrant workers in their home countries. Nigeria receives the largest amount of remittances in Africa and the third among developing economies; receiving 21 Billion US Dollars in 2015.

Large remittance inflows could, however, hurt the recipient economy when the flows are significant relative to the size of the recipient economy. With increasing remittance inflows relative to other capital inflows into Nigeria, remittances could have undesired outcomes, with the possibility of exchange-rate appreciation and a loss of competitiveness in the tradable sector. Using the Error Correction Model (ECM) and data over the period 1980 to 2016, this study explored the empirical evidence to examine the Dutch disease effects of remittance in Nigeria. The study investigated the effects and transmission channels of remittances to tradable and non-tradable sectors of the Nigerian economy. The study also empirically investigated the effect of remittance inflows on the competitiveness of agricultural and manufacturing sectors in Nigeria employing the Johansen cointegration test.

Our findings suggest that remittance inflows have a negative effect on the real exchange rate in the long run and the effect was found to be the same with other capital flows such as foreign direct investment and foreign portfolio investment. The implication of this result is that an increase in remittance inflows lead to an appreciation of the domestic currency, the naira. The opposite effect was found for foreign aid: an increase in foreign aid causes the real exchange rate to increase and hence contributes to the depreciation of the domestic currency.

The study further suggests that remittances have a positive effect on non-tradable sector. As found in the study, remittance inflows lead to an increase in the service sector contribution to total GDP. Similarly, remittances have positive effects on both industrial output and agricultural output even when the exchange rate appreciates. Our results showed that remittances exert higher magnitude of impact on the manufacturing sector competitiveness than the agricultural sector.

Policy recommendations were made to channel remittance inflows to investment in agriculture and manufacturing rather than household consumption expenditure.

Key words: Remittance, Dutch Disease, Exchange Rates, Tradable, Non-Tradable, Competitiveness

Table of contents

List of figures

List of tables

List of acronyms and abbreviations

ADF	Augmented Dickey Fuller test
AFEM	Autonomous Foreign Exchange Market
ARDL	Auto-regressive distributed lag
CBN	Central Bank of Nigeria
CUSUM	Cumulative sum control chart
DAS	Dutch Auction System
DNT	Demand for non-tradables
DSGE	Dynamic stochastic general equilibrium modelling
ECM	Error correction model
ECT	Error correction term
ER	Exchange rate
ERER	Equilibrium real exchange rates
FDI	Foreign direct investment
FEM	Foreign exchange market
FGLS	Feasible generalised least squares
GDP	Gross domestic product
GMM	Generalised method of moments
ID	Indifference curves
IFEM	Inter-Bank Foreign Exchange Market
KPSS	Kwiatkowski-Phillips-Schmidt-Shin stationarity test
MENA	Middle Eastern and North African countries
MTOs	Money transfer operators
ODA	Official development assistance
OLS	Ordinary least squares
PNT	Price of non-tradable
PP	Phillips Perron
PPF	Production possibility frontier
PPP	Purchasing power parity
RDAS	Retail Dutch auction system
RER	Real exchange rates
SAP	Structural adjustment programme
SFEM	Second-tier foreign exchange market

SC	Schwarz information criterion
SSA	Sub-Saharan Africa
TFP	Total factor productivity
UK	United Kingdom
USA	United States of America
WDAS	Wholesale Dutch auction system
WDI	World Development Indicators

CHAPTER 1
INTRODUCTION

1.1. INTRODUCTION

Remittance inflows have assumed a significant role as a source of foreign exchange in many developing countries. The volume of remittance transfers to many developing countries has exceeded foreign direct investment (FDI) and official development assistance (ODA) inflows. This surge in remittance inflows has been felt in Nigeria. Between 1980 and 2011, remittances represented about 3.5 per cent of gross domestic product (GDP) in Nigeria (World Bank, 2014). Within the same period, FDI as percentage of GDP was 3.1 per cent in Nigeria, while net ODA as percentage of national income was 1.1 per cent Nigeria (World Bank, 2014). These figures illustrate the importance of remittances when compared to other foreign inflows.

Remittances received by Nigerians stood at $22 million in 1980; this increased to $56 million in 1992, from which point it started to experience consistent increases until 2004 when it was $2.4 billion. In subsequent years, remittances surged from $14.6 billion in 2005 and had reached $22.9 billion in 2013 (World Bank, 2014). The average remittance inflows to Nigeria from 1980 to 1990 was $10.9 million. Remittances have increased substantially since the 1990s. Between 1991 and 2000, average remittance inflows to Nigeria were $855.76 million, indicating an increase of over 7,000 per cent. There was further phenomenal increase in Nigeria's remittances as it increased from $1.16 billion in 2001 to $22.97 billion in 2013 (World Bank, 2014).

The steady rise in Nigeria's remittance inflows is shown in Figures 1.1 and 1.2. Figure 1.2 shows the relative importance of remittance in Nigeria's economy, depicted by the share of remittances in the GDP. It is seen that remittances have gradually assumed a greater proportion of GDP, starting especially from the 1990s, where remittances as a share of GDP for the decade fluctuated between two per cent and six per cent. In the decade of the 2000s, remittances as a share of GDP rose to a peak of 13 per cent in 2005, but then started declining and reached their lowest point of 1.57 per cent in 2003. Thus, the decade of the 2000s had the highest ratio of remittances and also the highest volatility in the proportion of remittances to GDP.

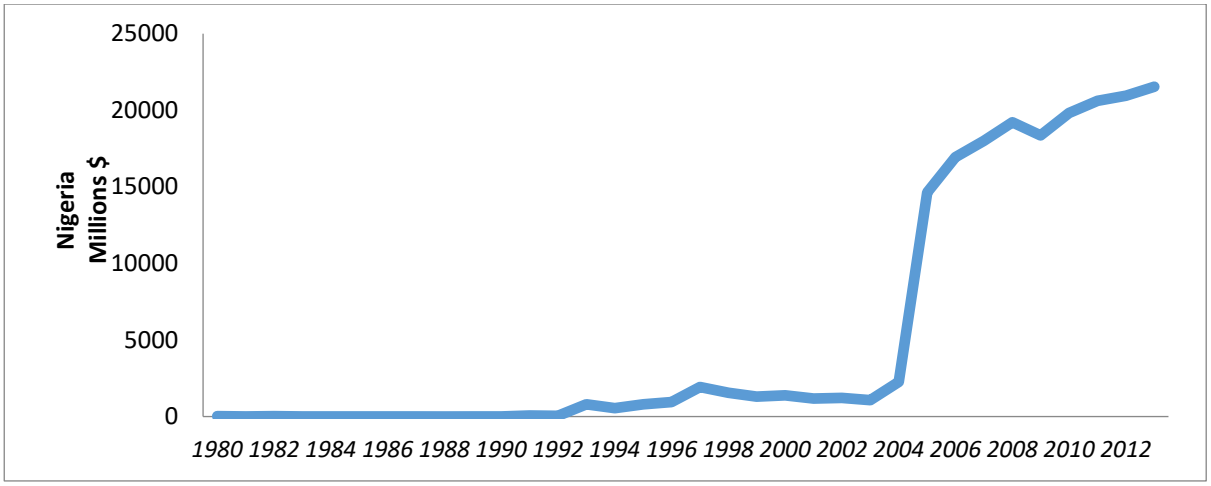


Figure 1.1: Remittances Received in Nigeria (Million $)
Source: World Bank, 2014.

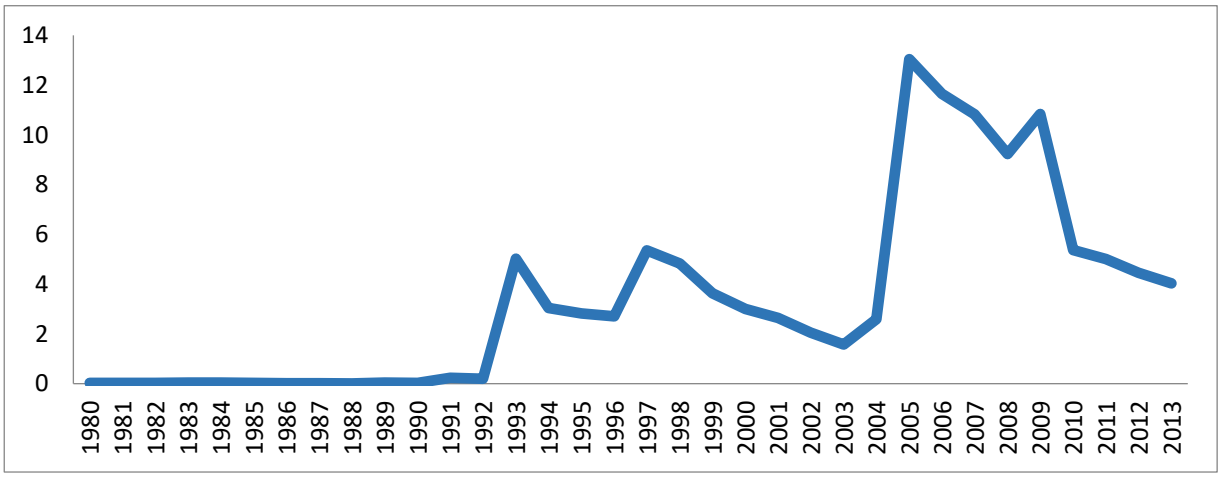


Figure 1.2: Remittance Inflows as % of GDP in Nigeria
Source: World Bank, 2014.

There has been massive inflow of remittances generally into Sub-Saharan Africa (SSA) in the last couple of decades. From Figure 1.3 it is seen that in 1980 total remittance inflows to SSA were $1.39 billion. This had increased slightly to $1.79 billion in 1990. The surge in remittances to SSA started in 2005 when remittance inflows increased from $7.81 billion in 2004 to $20.11 billion in 2005. Remittances continued to increase over the next couple of years and by 2014 they totalled $38.27 billion. Remittances to Nigeria have followed the trend in the region. However, it is interesting that Nigeria accounts for a substantial proportion of remittances to SSA. In 1980, remittances to Nigeria made up only 1.57 per cent of total remittances to SSA. However, by 1993, remittances to Nigeria were 31.66 per cent of the total going to the region. Nigeria's proportion increased further and by 2014, Nigeria accounted for 54.41 per cent of remittances flowing to the SSA region.

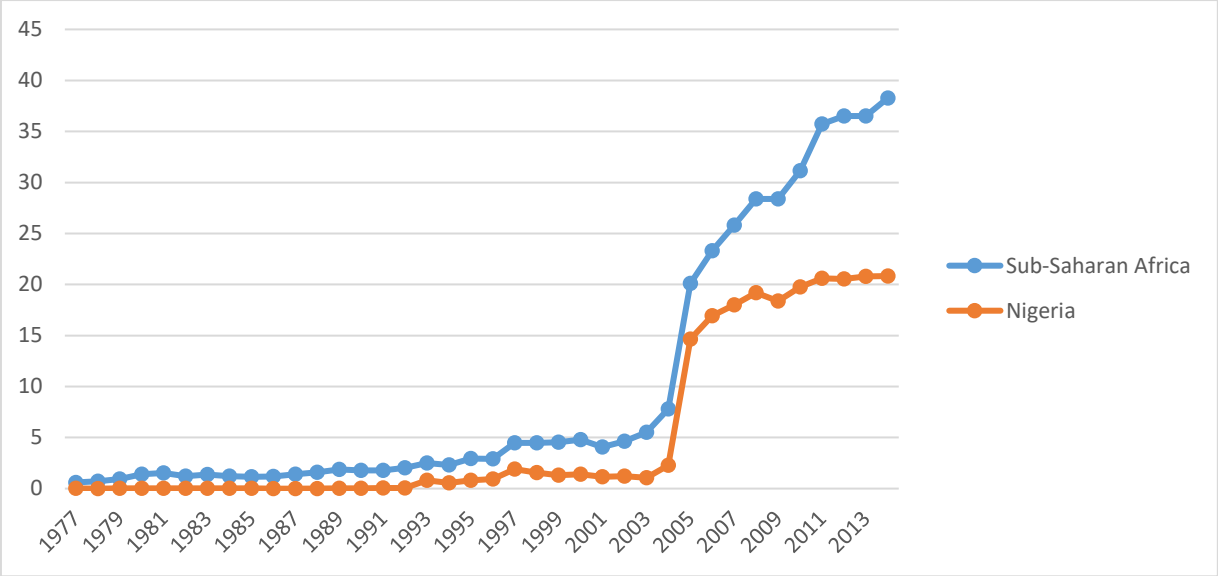


Figure 1.3: Remittance Inflows to Nigeria and Sub-Saharan Africa ($ billions)
Source: World Bank, 2014.

The high figures of remittance inflows have led to various propositions on their economic impact. It has been argued that remittances can have positive and negative effects. On the one hand, remittances can promote economic growth (Stark & Lucas, 1988; Ajilore & Ikhide, 2013). Remittances could be a form of investment in the receiving countries, thus helping such economies to boost their overall economic performance and help the migrant workers survive in times of crisis (Makhlouf & Mughal, 2013). On the other hand, in import-dependent economies like Nigeria, remittances could lead to appreciation of the exchange rate through an increase in supply of foreign currency, thus hurting their competitiveness. This is referred to as the Dutch disease. Overvalued exchange rates can make imports cheap in terms of domestic currency but expensive in terms of foreign currencies, thereby worsening the current account position of the receiving economies. Furthermore, increased demand arising from remitted money raises prices in the non-tradable sector, while the prices in the tradable sector are somewhat sticky, especially in a small open economy, because the prices of the tradable sector are often determined internationally. The implication is that the tradable sector becomes less competitive in the international market.

The broad objective of this dissertation was to ascertain whether remittance inflows to Nigeria have exerted Dutch disease effects on the economy. Studies have shown the relevance of foreign exchange inflows, especially in the oil sector, for the Dutch disease. The study investigated whether remittances to Nigeria follow the same pattern.

It is important to consider the implications of the increased flow of remittances to Nigeria for several reasons. First, remittances enhance the welfare of migrant families in the country of origin, as these

receipts increase their disposable income and in turn their expenditure on welfare. This enhances consumption of goods and services such as education, health care services and food. Second, remittances affect labour market decisions, school retention levels, and export sector competitiveness, and create moral hazard problems (Funkhouser, 1992; Glytsos, 2002). Third, remittances have been found to be important drivers of economic growth (Faini, 2002; Makhlouf & Mughal, 2013).

1.2. STATEMENT OF THE RESEARCH PROBLEM

One of the key macroeconomic objectives of any country is to keep unemployment low. This is more so in a developing economy like Nigeria, grappling with high levels of poverty and low human development (UNDP, 2016). An overvalued currency hurts the economy in many ways. Remitted money raises demand for mostly non-tradables, thereby forcing the prices up. This will lead to the movement of labour from the tradable sector to the non-tradable sector, where Nigeria competes with other developing countries, especially in agricultural and low-level industrial products. This is particularly important for Nigeria as agriculture employs close to 75 per cent of the population and, in terms of output, contributes 21 per cent to the GDP (NBS, 2014).

Overvalued currencies make a country's exports relatively expensive. Imports become relatively cheaper and consequently local production dwindles, thus hurting the economy's competitiveness. Furthermore, arising from low production levels, tradable sectors in the country will lose heavily on the benefits of technology transfer required to capacitate the local workforce. As noted by Rajan (2010), learning by doing is critical for imbibing productive skills and spillovers necessary for long-term productivity growth. This is because of the relevance of the tradable sector for the absorption of newer technologies (spillover effects), which has huge implications for productivity growth through technological innovation. This will have negative implications for economic growth.

It follows that the recent concerted efforts in Nigeria aimed at economic diversification may be at risk from high remittance inflows. Given the dominant role of oil in the economy and the volatility of oil prices with the attendant effect on the economy, there is consensus among policymakers in Nigeria for the need to diversify the economy and reinvigorate the agricultural sector, where the country has a competitive edge. Local manufacturing of fast-moving consumer goods and light equipment manufacturing, for which ample market exists at home and in the West African sub-region, should be vigorously pursued with economic policies drawn to drive them. It is therefore pertinent to investigate how remittance inflows have affected the Nigerian economy.

The exchange rate of the Nigerian currency has been unstable over time and the country's currency has been appreciating since the 1980s. Also, in terms of competitiveness of the tradable sector

(agricultural and manufacturing sectors), there are some noticeable Dutch disease symptoms. First, agricultural raw materials export as a percentage of merchandise export has been marginal in Nigeria, recording an average of 1.1 per cent between 1980 and 2013. However, agricultural import, especially food import, has been huge. Second, the manufacturing sector in Nigeria is losing competitiveness, with average manufacturing export and import as a percentage of merchandise exports and imports recording 1.9 per cent and 73.8 per cent, respectively, between 1980 and 2013.

These features are symptomatic of the Dutch disease but a definite conclusion about this is ultimately an empirical issue. Thus, it would be useful and insightful to empirically examine whether Dutch disease exists because of remittances in Nigeria. This issue informed the questions this study examined.

1.3. RESEARCH QUESTIONS

The research questions this study addressed were:

1. What is the link between remittances and the real exchange rate in Nigeria?
2. What are the transmission channels of remittances to the tradables and non-tradables sectors in Nigeria?
3. What are the likely effects of the exchange rate and remittances on different sectors of the economy?
4. How have remittances affected the competitiveness of the agricultural and manufacturing sectors of the economy?

Answering these questions shed light on the observed symptoms of Dutch disease in Nigeria, whether it followed the expected process and whether the symptoms were due to remittances inflow.

1.4. AIMS AND OBJECTIVES OF THE STUDY

The broad aim of this study was to investigate whether remittances have Dutch disease effects in Nigeria. Specifically, the study empirically validated the existence or otherwise of Dutch disease through remittances in Nigeria. The main objective was subdivided into the following specific objectives:

1. Examine the relationship between remittance inflows and the exchange rate in Nigeria;
2. Examine the transmission channels of remittances to the tradable and non-tradable sectors of the Nigerian economy;

3. Examine the impact of remittances and the real exchange rate on the agricultural and manufacturing sectors in Nigeria;
4. Examine the effects of remittances on the competitiveness of the agricultural and manufacturing sectors of the economy.

1.5. JUSTIFICATION OF THE STUDY

This study examined the Dutch disease effects of remittances in Nigeria and is important for several reasons. First, although several studies such as Kemegue, Van Eyden and Owusu-Sekyere (2011), Fayad (2010), Baas and Melzer (2012), Rabbi, Chowdhury and Hasan (2013) as well as Makhlouf and Mughal (2013) have examined the Dutch disease effect of remittances in developing countries, these studies did not cover Nigeria. In addition, many of the existing studies made use of broad cross-country data to examine the Dutch disease effects of remittances but it is important to conduct a detailed country-level analysis to validate all possible channels through which remittances cause Dutch disease. This will not be possible in studies using broad cross-country data. Kemegue et al. (2011) as well as Okodua and Olayiwola (2013) used the system generalised method of moments (GMM), feasible generalised least squares (FGLS) and linear dynamic panel data model. These are all panel data multiple country studies that may be bereft of specific country situations and therefore short on policy analysis.

Secondly, existing studies only examined the Dutch disease and exchange rate relationship, while they ignored the implications for competitiveness. Competitiveness is particularly important to African countries, given the drive towards diversification and employment generation. A thorough investigation of Dutch disease should go beyond the relationship between remittances and the exchange rate only, because validating the presence of Dutch disease depends on the effects of exchange rate appreciation on tradable and non-tradable sectors of the economy. Some studies, such as Guha (2013), used the dynamic stochastic general equilibrium (DSGE) model to investigate the Dutch disease effects of remittances. This is very appropriate if the objective is to trace the impact of remittance to the individual household. However, this was not the focus of this study. This study was concerned with macroeconomic issues; that is, the consequences of remittances for output and employment.

This study drew from the work of Corden and Neary (1982) and Ratha (2013) to investigate the Dutch disease effects of remittances in Nigeria. There are several channels through which remittance influences macroeconomic variables and the receiving economy specifically. This study identified four such channels and these can be identified as follows:

First, there is the exchange rate channel. An increase in remittance inflows (R) increases the supply of foreign exchange (SS$) and this will lead to an appreciation of the exchange rate (ER). This means that foreign goods become cheap, while domestic goods get expensive, resulting in an increase in demand for imported tradable goods. The imported tradable goods then compete with infant domestic tradable goods leading to lower demand in the tradable sector (DDT). Assuming that the supply of foreign exchange is solely for purchasing goods and services and also assuming that households consume a basket of commodities covering both tradables and non-tradables, then the demand for the non-tradable goods sector (DDNT) will increase relative to the import competing tradable sector. This channel can be represented as:

$$R \uparrow SS\$ \uparrow ER \uparrow DDNT \uparrow DDT \downarrow \tag{1.1}$$

Second, there is the spending channel. With an increase in remittance inflows (R), more income is available for spending (SP), leading to increased demands for both tradable (DDT) and non-tradable goods (DDNT). This will make the relative price of non-tradables increase relative to tradables. That is, since the prices of the tradable sector (PT) are determined internationally and the tradable sector is also imported competitively, the rate at which the price can increase is limited, making the relative price of non-tradables (PNT) compared to the tradable sector increase. This implies that the supply of the tradable sector (SST) compared to the non-tradable sector (SSNT) falls because it is more profitable to produce non-tradable than tradable goods. This results in the shrinking of the tradable sector, while the non-tradable sector expands. This is related to the popular Rybczynski effect (1955). This channel is represented as:

$$R \uparrow SP \uparrow DDT \uparrow DDNT \uparrow PNT \uparrow \bar{PT}, SST \downarrow SSNT \uparrow \tag{1.2}$$

Third, there is the resource movement channel. When the residents in a country have more income as a result of increased remittance inflows (R), they tend to increase their spending on non-tradable services such as healthcare, education, hospitality, and construction, implying an increase in demand in the non-tradable sector (DDNT). Higher demand will lead to higher prices in the non-tradable sector (PNT), implying higher profits in the non-tradable sector. This stimulates the suppliers in the non-tradable sector (SSNT) to produce more and they attract more labour and capital from the tradable sector (LT, KT) to the non-tradable sector (KNT, LNT). This leads to higher wages in the non-tradable sector. The wage rate of the remaining labour in the tradable sector will also increase as a result of the decline in labour supply. The overall result of this is an increase in wage rates. That is, movement of labour from the tradable to the non-tradable sectors implies an increase in the marginal

productivity of the remaining labour in the tradable sector. Given that wage is price multiplied by marginal product of labour, this implies a higher wage rate in the tradable sector. However, since the international price of traded goods is given, the higher wage rate increases the costs of production and this results in lower profitability in the tradable goods sector.

$$R \uparrow SP \uparrow DDT \uparrow DDNT \uparrow PNT \uparrow \bar{PT}, LNT \uparrow LT \downarrow wNT \uparrow wT \uparrow SSNT \uparrow SST \downarrow \quad (1.3)$$

The fourth channel is the investment channel. Lucas and Stark (1985) assert that remittances mostly driven by selfish reasons, including the exploitation of investment opportunities, will tend to be procyclical since investment itself is procyclical. This means that inflows of remittance will lead to appreciation of the exchange rate through foreign exchange supply for investment purposes. This will increase the overall output of the economy. However, since appreciation of the exchange rate makes the tradable sector less competitive through competition with goods, the investment is assumed to be biased toward the non-tradable sector facing less international competition. This could explain why some developing countries have a higher proportion of services investment in their GDP. That is, this could be the reason many developing countries jump a phase (manufacturing sector development phase) in the process of their economic development.

Most studies in the field have focused either on aggregate capital inflows and their impact on exchange rates or broadly examined the individual components of capital flows, focusing mostly on their impact on economic growth. This study focused on a component of capital flows that has received very little attention in terms of its total effect as outlined above, going beyond their impact on economic growth. The researcher is not aware of any study examining these issues for the Nigerian economy.

CHAPTER 2
OVERVIEW OF REMITTANCE INFLOWS AND SECTORAL PERFORMANCE IN NIGERIA

2.1. INTRODUCTION

Despite the abundant endowment of human and natural resources, Nigeria's economy has tottered over the past decades. With an average of 6.4 per cent annual economic growth experienced between 2004 and 2014, human development indicators have not shown remarkable improvement, revealing an unsustainable and non-inclusive growth pattern. The economy is largely dependent on oil export, making it vulnerable in the short and medium term to shocks in the international market. With crude oil accounting for over 80 per cent of government revenue, non-oil tax revenues remain low at five per cent of GDP. Agriculture, which employs more than 70 per cent (NBS, 2016) of the population, has remained largely subsistent, while industrial and manufacturing sectors have been challenged by infrastructural constraints. Given the demographic advantage (a youthful and upwardly mobile population), huge market and over 80 million hectares of arable land, accounting for about 23 per cent of arable land across all of West Africa, the Nigerian economy holds the promise of a regional powerhouse. Increasingly, young qualified and semi-skilled Nigerians are migrating to other parts of the world for economic opportunities, resulting in huge inflows of remittances.

Remittance is an important segment of financial flow in Nigeria as it is now second to oil as a source of foreign exchange, outpacing other sources (Agu, 2009). Table 2.1 shows the trend of remittances in comparison with other sources of foreign capital inflows such as net ODA and FDI, using five-year annual averages between 1980 and 2009. From 1980 to 1994, other foreign inflows exceeded remittances and between 1995 and 1999 remittances surpassed other inflows with $1.3 billion. Ever since, remittances have been consistently above other sources, which elevated them as a particularly important source of autonomous income.

Table 1.1: Trend of Annual Average of ODA, FDI and Remittances

Year	ODA (USD) million	FDI (USD) million	Remittances (USD million)
1980-1984	104	158	16.4
1985-1989	225	71	5.8
1990-1994	386	1,100	295
1995-1999	274	1,250	1,300
2000-2004	416	1,620	1,420
2005-2009	5,150	6,520	17,400

Source: Author's computation from World Bank, 2012.

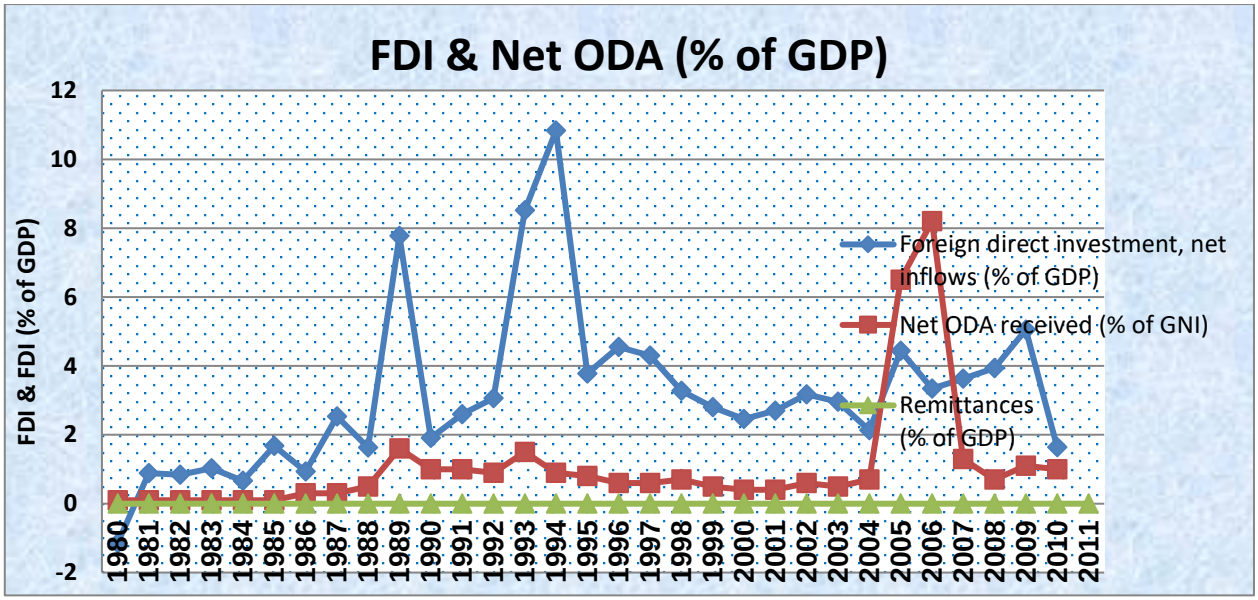


Figure 2.1: Trend of Annual Average of ODA, FDI and Remittances

Mainstreaming remittance inflows into economic planning in Nigeria is yet to receive the required policy attention. Policies to channel the use of remittances are rudimentary and uncoordinated. With so many remittance instruments, senders, operators, agents, recipients and corridors, the Nigerian remittance industry is not presently well-positioned to help contribute meaningfully to economic growth. Further, the fact that the Nigerian financial sector is developing fast in depth and scope is another factor that increases interest in remittance flow in Nigeria. Though the link between the growth in the financial sector and the real sector performance is very weak, policymakers are working hard to improve the incentive to grow the financial sector in such a way that it will have a positive impact on the real sector in the near future. Such efforts are based on an understanding of the huge resources required for economic growth in the country.

2.2. OVERVIEW OF REMITTANCE INFLOW IN NIGERIA

Although migrant remittances are playing important roles in the economy of developing countries, little effort has been devoted by their governments to encourage the inflows. Some countries, such as Nigeria, do not even keep adequate record of their remittances (Agu, 2009). It has been proven that remittance can promote economic growth by facilitating financial market development, serving as a source of financing entrepreneurial activities, providing insurance against shocks, bridging the savings gap, financing household expenditure, and bridging external gaps (Nyeadi & Atiga, 2014). With the large volume of human capital exported from the country as a result of emigration since the adoption of the Structural Adjustment Programme (SAP) in the early 1980s, remittances ought to have contributed immensely to the economic development of Nigeria, if proper policy measures and

incentives were provided. Migrant remittances are not equally distributed in Sub-Saharan Africa (SSA). From Figure 2.3, it is observed that Nigeria is not only among the top ten remittance recipients in SSA countries but receives the largest remittance inflows into the region. Nigeria received a chunk of $US 21 billion remittance inflow in 2014. This is not surprising as Nigeria is the most populous country in the region and also has the highest number of migrants in diaspora.

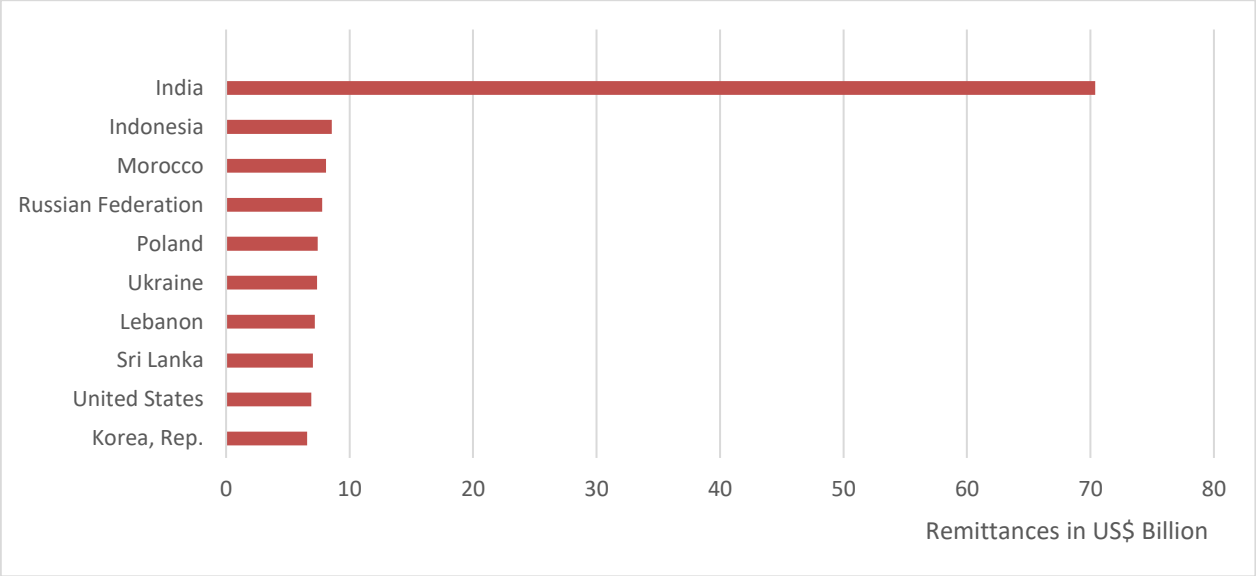


Figure 2.2: Top Ten Remittance Recipient Countries in the World in US$ Billion
Source: World Bank, 2016.

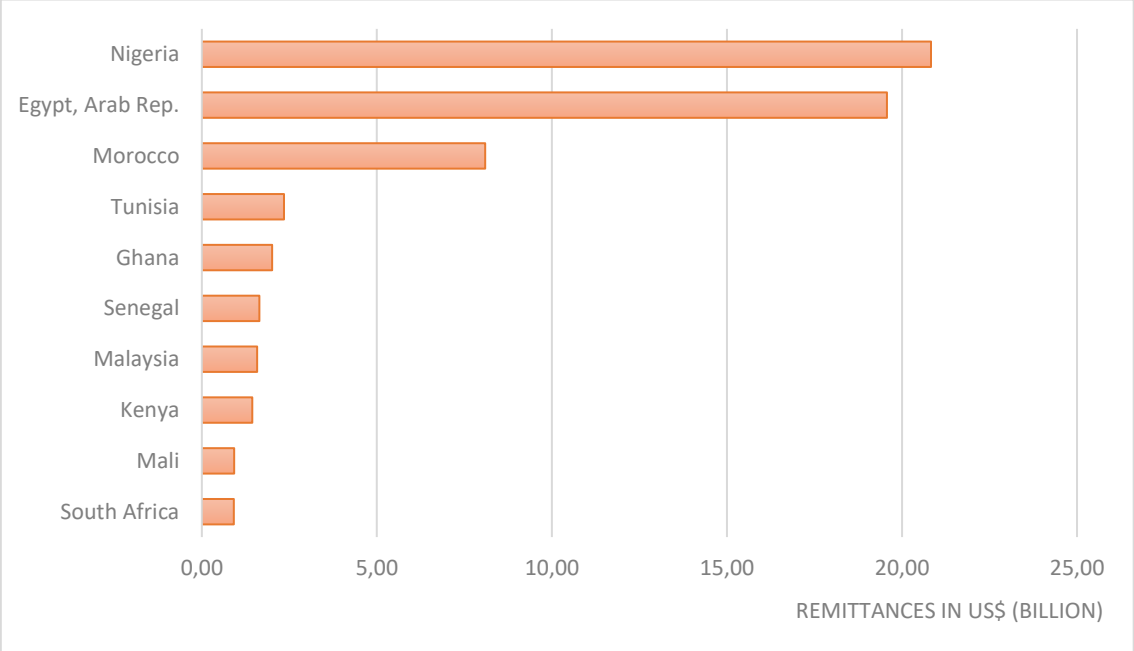


Figure 2.3: Top Ten Remittance Recipient Countries in Sub-Saharan Africa in US$ Billion
Source: World Bank, 2016.

In Nigeria, remittances have an immense potential to stimulate growth, which might motivate some policy institutions to channel their resources to strengthen growth in this sector in the near future. Remittance inflows might be underestimated. Remittance inflows into Nigeria are mostly from the United States of America (USA), the United Kingdom (UK), Italy and other Western European countries (USAID, 2007a).

Figures 2.4 and 2.5 show remittances received expressed as a percentage of GDP in Nigeria. From the 1980s to the early 1990s, the movement in migrant remittance was not perceptible and the value was below one billion dollars. Throughout the 1980s and 1990s, using a ten-year annual average, the inflows were US$0.01 billion and US$0.53 billion, respectively. Remittances started rising in the mid-90s and in 1997 a billion dollars was first recorded. The inflows fluctuated mildly in the early 2000s before a dramatic increase was noticed in the middle 2000s and a total sum of US$6.16 on average was recorded during the period. In 2010, remittances were US$19.8 billion and increased by 4.1 per cent in 2011, reaching US$23 billion in 2013. It will be observed that over the years, remittance inflows in Nigeria have been on an upward trend apart from the slight fall in 2009. Though there were no accurate records of remittances, many factors have accounted for the increase in its inflow, among which were a surge in the population of Nigerians in diaspora, the reduced cost of remittance transfer, and the exchange rate, which made the value of domestic currency relatively cheaper.

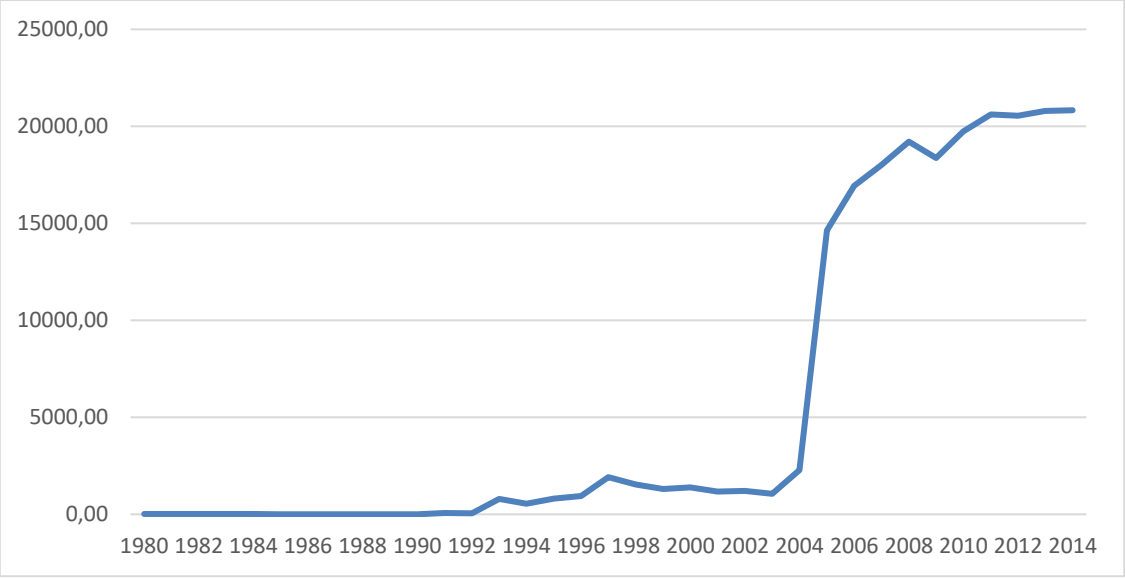


Figure 2.4: Remittances Received in Nigeria (Million $)
Source: World Bank, 2016.

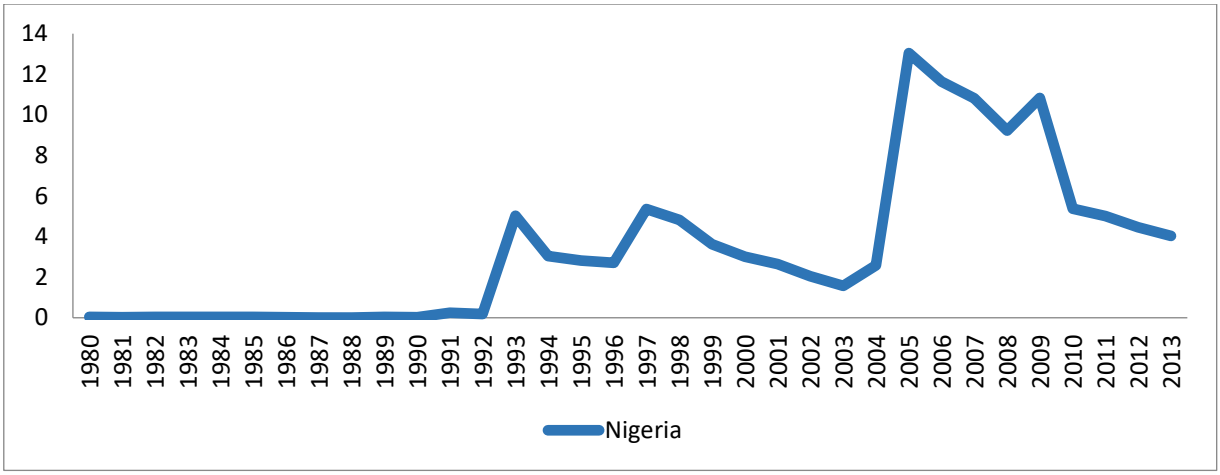


Figure 2.5: Remittance Inflows as % of GDP in Nigeria
Source: World Bank, 2016.

Premised on the prevailing policy measures and incentives in place, it is safe to assert that policy interest in migrant remittances is still weak in Nigeria, despite intensive human capital export from the country since the adoption of the SAP. This is strange, because such huge emigration as witnessed since the 1980s should make the surge in remittances predictable, given the structure of social ties among African families. Lack of policies to channel remittances to an "appropriate" – preferably investment – sector over time has impacted adversely on the overall contribution of remittances to economic development in Nigeria.

2.2.1. High-Skilled Migration in Nigeria

The Nigerian diaspora population has been on the increase. Highly skilled, semi-skilled and unskilled labour are all migrating for economic opportunities. They have become well educated and trained, having professional jobs and high median income levels when compared to other immigrant groups. The emigration out of the country, especially in more recent times, has been at a cost to Nigeria, as the best, brightest and most able have left the country. This rapid migration of the country's professionals has been termed "the brain drain".

Remittance inflow is one of the ways by which emigration has benefitted the families of migrant workers. The Nigerian diaspora maintains strong ties with their families, friends and relatives back in Nigeria, and influence the social, political and economic development of the country.

Several factors account for the migration of highly skilled workers from Nigeria. The probability of finding a job abroad is higher than at home due to a labour shortage outside the country and existing networks of Nigerian migrants who provide help in finding work. On the demand side, changing demographics and labour market needs in many industrialised countries are important factors (Haas,

2007). Some push factors prompting migrants to leave Nigeria may also include poor socioeconomic living conditions, a rigid government employment system, a drop in real income, currency devaluation and corruption. In contrast, pull factors attracting potential migrants to enter a specific country of destination are high salaries, professional career development and acquisition of high-level skills.

Highly skilled migration is more common among health personnel than in other sectors in Nigeria. The volume of migration has always been on the increase, while their immigration or return has recorded a very low rate in the country and the studied institutions, in particular. This is especially common among the core health professionals such as doctors and nurses, while paramedics such as pharmacists and medical laboratory scientists are seldom affected (Abejide, 2014). The prominent destinations have been the UK, followed by the USA and Canada. Also, a large number have recently migrated from Nigeria to the Middle East, other countries in Europe, South America and Asia (Abejide, 2014).

Notably, the predominant and emerging destinations could positively benefit the country in terms of remittance, if bilateral and multilateral agreements could be negotiated between Nigeria and the recipient countries. Moreover, highly skilled migrants from Nigeria are becoming more attractive labour inputs for industrial countries experiencing demographic shifts characterised by skilled labour-force shortages in certain sectors of their economies (Fadeyi, 2014).

Emigration of highly skilled Nigerians leads to a significant loss of skills available for development. Migrants acquire new skills and experience that are useful at home. Trade is also stimulated between Nigeria and the host countries. Meanwhile, cross-border migration leads to a lack of skilled manpower in key sectors of national development. On the social front, long-term migration negatively affects the male to female ratio and leads to disrupted family structures, which in turn might affect the growing feminisation of migration in Nigeria (Fadeyi, 2014). A crucial policy challenge is to involve Nigerians in the diaspora in innovative forms of cooperation, contribution and knowledge transfer to promote socio-economic development.

2.2.2. Significant Corridors of Remittances into Nigeria

The number of Nigerians living abroad more than doubled between 1990 and 2013. The figure rose from 465,932 in 1990 to 1,0303,22 in 2013. Most migrants were found in the less developed regions in the early 1990s and late 2000s. However, there is a new pattern of development in the destination of Nigerian emigrants: about two thirds of them lived in developed countries in 2013 compared with only 33.8 per cent in 1990 living in this region (IOM, 2014). The major factors accounting for the

migration of Nigerians to this developed region of the west are prospects of job opportunities and a search for knowledge. The decreasing number of Nigerian emigrants to less developed regions is due to poor economic conditions, social upheavals and political unrest. Migration to these regions is short-term and migrants include people in business, trade and construction (IOM, 2014).

2.2.3. Emerging Corridors of Remittances into Nigeria

Migration into Asian countries like China and India that hitherto had little influx of Nigerians has been on the increase in recent times, although the number of Nigerian emigrants to these countries is still relatively low. The spread of Nigerian citizens in foreign countries in 2013 was 35.6 per cent in African countries; 34.2 per cent in Europe and 26.4 per cent in North America, while the rest lived in Asia, Latin America, the Caribbean and Oceania. Nigerian migrants in Africa are mostly found in West Africa due to the Economic Community of West African States (ECOWAS) Protocol on Free Movement of Persons. In order of preference, the major destinations of Nigerians in Europe were the UK (184,314), Italy (48,073), Spain (36,885), Germany (22,687), and Ireland (18,540) (IOM, 2014). In North America, the USA has always recorded a large influx of Nigerian migrants since 1990 as it has about 25 per cent of all Nigerian emigrants. The large influx into the USA was due to better opportunities provided in terms of employment, education and training as well as a peaceful environment relative to other countries in the world.

These recipient countries have formed important remittance corridors for Nigeria. They include the UK, other countries in Europe, the USA, Canada and some Asian countries (Afolayan, 2009). The USA and the UK have emerged as the significant corridors for Nigeria (UNCTAD, 2006). In analysing these corridors, it is important to consider the conditions that exist in the remittance corridors, such as the volume of transfers, various money transfer operators, financial access and the nature of migration.

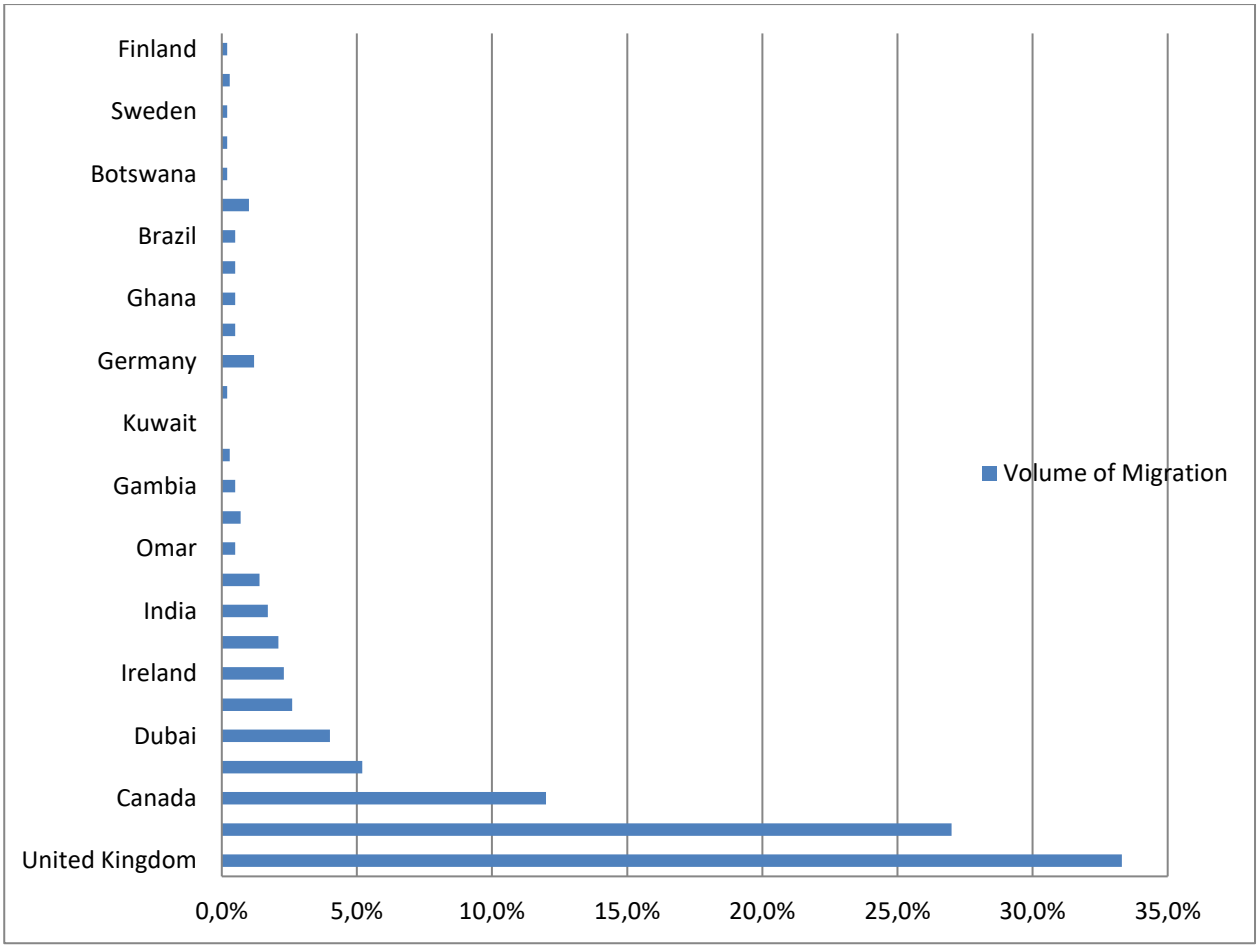


Figure 2.6: Destination of Emigrated Health Professionals from Nigeria
Source: Fieldwork from Abejide, 2014.

The United Kingdom is among the top remittance originating countries in the world. About US$4.42 billion was transferred in 2004 from the UK to developing countries in the form of remittances and close to 15 per cent of this flow went to Nigeria (Hernandez-Coss & Bun, 2006). There are no specialised channels (corridors) for the transfers, apart from the usual cash-to-cash money transfer operators (MTOs), although Nigerians have highly educated migrants and well-established migrant communities that remit money home frequently. Formal and informal remittance agents equally dominate the UK-Nigerian remittance corridor. Although several financial institutions exist in this corridor, people prefer to send money informally. The usual method of sending money to the beneficiaries is through those travelling to the countries, and at times, remittances are in kind in the form of clothes or cars, as well as purchasing recharge cards and sending the pin by e-mail (Hernandez-Coss & Bun, 2006). A dual financial formal and informal environment exists in Nigeria despite over 3000 functioning commercial bank branches available in the country. These financial intermediaries compete for clients. The preference of Nigerians for the informal remittance

intermediaries is due to a lack of trust in the formal institutions, and poor means of transport and communications outside urban centres (Herenandez-Coss & Bun, 2006).

The pattern of remittance in the US–Nigeria corridor is similar to the UK–Nigeria corridor. There is competition among numerous players in the corridor. The corridor can be looked at from two dimensions – the inbound (Nigeria side) and outbound (the US side). Activities in the outbound are diffused and unclear, while for the inbound about 21 banks are identified as major players (USAID, 2007a). On the inbound side, banks are the only agents that are allowed to carry out transfers with the exclusive cooperation of various MTOs such as Western Union and MoneyGram. Banks compete for transactions and depend on their competitive advantage such as location, value-added product and service to get customers. As at 2007, 21 out of 25 banks were in agreement with the MTOs; 15 worked with Western, five with MoneyGram, and one with Coinstar and Vigo Cooperation (Vigo is a subsidiary of Western Union). Western Union is the largest competitor, taking charge of approximately 80 per cent of money transfers by banks (Table 2.2). Consequently, out of 340,000 transactions conducted by banks in a month, 270,000 were carried out by Western Union, 60,000 by MoneyGram, and 10,000 were shared between Vigo and Coinstar (Table 2.2).

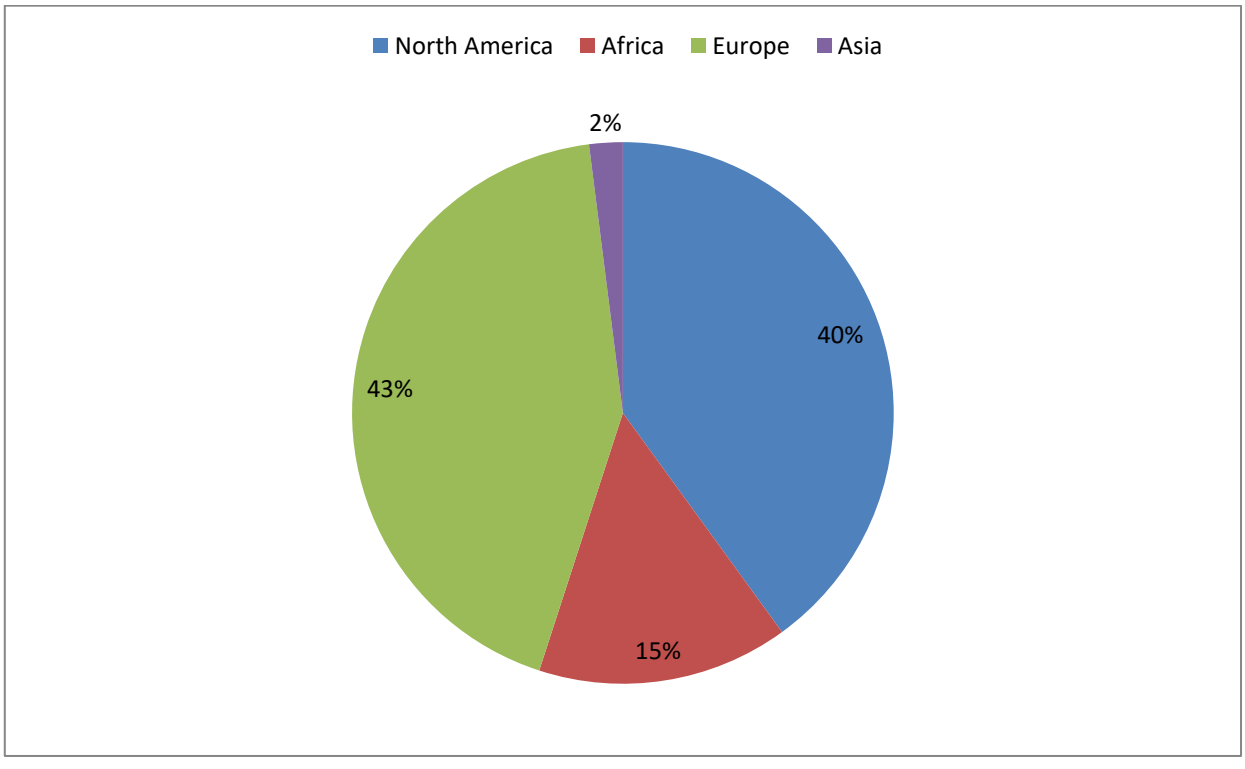


Figure 2.7: Remittances Inflow to Nigeria by Continent of Origin
Source: Development Prospects Group, World Bank, 2014.

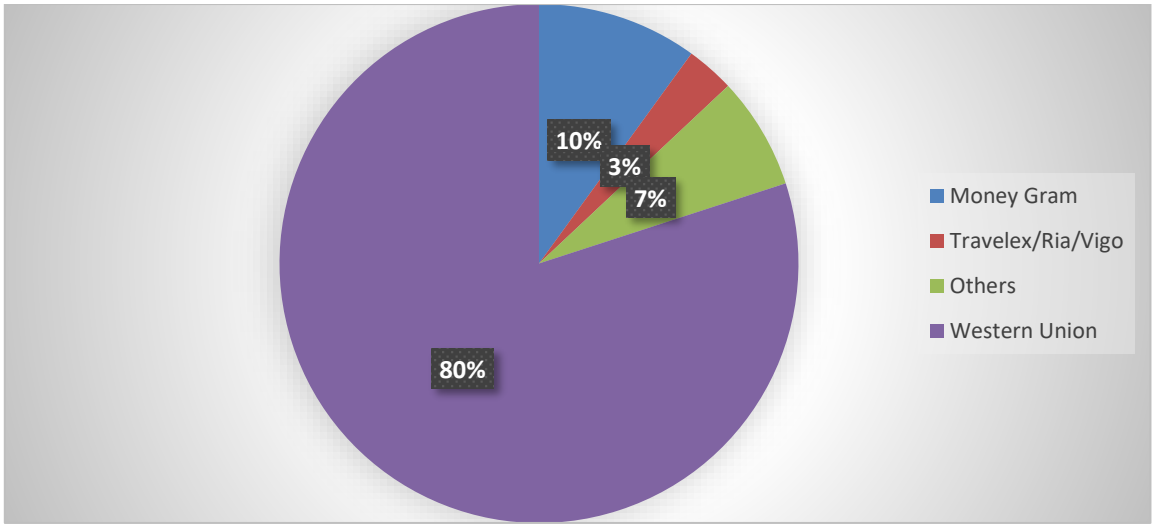


Figure 2.8: Market Shares of MTOs Operating in the UK–Nigeria Corridor
Source: Raul and Bun, 2006.

Banks in Nigeria	MTO	Transactions
Bank PHB (PlatinumHabib Bank Ltd)	MoneyGram	
Equitorial Trust Bank Limited	MoneyGram	30,000 combined
Spring Bank Nigeria Ltd	MoneyGram	
Union Bank of Africa Plc.	MoneyGram, Vigo and Coinstar	
United Bank for Africa Plc. (UBA)	MoneyGram	25,000
Access Bank Nigeria Limited	Western Union	8000
Diamond Bank Plc	Western Union	8000
EcoBank	Western Union	10000
Fidelity Bank Plc	Western Union	125000
First Bank Nigeria Plc	Western Union	32000
Zenith Bank Plc	Western Union	
First City Monumental Bank Plc	Western Union	
Guaranty Trust Bank Plc	Western Union	
IBTC—Chartered Bank Plc	Western Union	
Intercontinental Bank Plc	Western Union	7000 combined
Skye Bank Nigeria Ltd.	Western Union	
Sterling Bank Nigeria Ltd.	Western Union	
Unity Bank Nigeria Ltd.	Western Union	
Wema Bank Plc	Western Union	
First Inland Bank Plc	N/A	
Stanbic Bank Nigeria Ltd.	N/A	

Table 2.2: Banks Paying Remittances by Partner and Estimated Transaction

Source: USAID, 2007a.

From the outbound side of the corridor, the number of MTOs is very small and Western Union controls a significant portion of the transactions. Other MTOs include MoneyGram and Vigo. Western Union transfers from the USA to Nigeria represent about 50 per cent of all transfers to Nigeria (USAID, 2007a). This is unlike the UK corridor, where there exists several MTOs that compete for remittance transfers. The companies include Abbey, Cashmo, Chequepoint, Coinstar Money Transfer (formerly Travelex), Double Crown Enterprises, Money-Systems, MoneyGram, Smart Transfer, Western Union, and World Money Move. These MTOs do not hold formal agreements with Nigerian banks in order not to violate the exclusive agreement these banks hold with the Western Union and MoneyGram. There is no record of the transactions, but the volume is not negligible (USAID, 2007a).

Several factors determine the method of remittance transfer to Nigeria. As expected, the transaction cost, speed and reliability of the transfer service are significant considerations. At the individual level, factors such as access to rural areas, confidentiality, confidence in banks, access to undocumented workers and peculiarities of the corridors may be important in remitting money. Apart from the fact that the transfer mechanism of remittance reflects the conditions surrounding the remitters, it also shows that the convenience of the recipients in getting the remitted items is particularly important. Though the cost of sending remittance varies across corridors, it is largely determined by the level of competition among the transfer agents, the exchange rates, the regulatory barriers for remittance service providers and remittance volume. This reflects limited levels of financial expansion in Nigeria (Hernandez-Coss, 2006).

2.2.4. Transaction Costs of Remittances to Nigeria

Most of the past studies on remittances focused on their gross value without looking at the net flow. It is therefore worrisome and confusing to analyse the impact of remittances on an economy in relation to other sources of external finance like FDI and ODA without adjusting for the cost of remittances. Assessing the impact of the aggregate figure of remittances can exaggerate the effects such flows have on the economy of the recipient country. It is therefore imperative to adjust for the cost of remitting money when evaluating the effect the procedure has on developing countries like Nigeria.

The cost of remittances varies from one channel to another in Nigeria and depending on the channel, it could be relatively high or low. This may have an effect on the volume of remittances. From Table 2.3, the average cost of sending money to Nigeria from the USA through Western Union was about seven per cent for a sum below $1 billion and 5.5 per cent for sums above $1 billion. This is very prohibitive compared to other countries like Mexico (4.50%), El Salvador (3.5%), Tajikistan (3%)

and the Philippines (5%). The reason for this high cost of transfer to Nigeria is that only banks are allowed to pay remittances and they hold exclusive agreements with the MTOs. This gives direct incentives to the consumers to use informal transfer (USAID, 2007b).

Table 2.3: The Cost of Sending Remittances to Nigeria

Western Union: Sending From New York				
Method of Transfer	100.01–500	500.01–1000	1000.01 and Over	FX Commission
In person	$10.50	$18.50	2.50%	3%
By phone	$10.50	$18.50	2.50%	3%
Online	$10.50	$18.50	2.50%	3%
Cost (%)	4% on 300	4% on 500	2.50%	3%
Western Union: sending from other cities in the United States				
Method of Transfer	100.01–200	200.01–300	300.01–400	400.01–500
By phone	$33	$40	$45	$53
Online	$22	$29	$34	$43
MoneyGram				
Method of Transfer	.01–500	500.01–1,000	1,000.01 and over	FX commission
In person	$9.99	$14.99	2% of principal	
Cost (%)	3%	3%		2.70%
Cost of Remittances worldwide				
	Mexico	**El Salvador**	**Tajikistan**	**Philippines**
Cost (%)	4.50%	3.50%	3%	5%

Source: USAID, 2007b.

The MTOs still play a major role in the remittance market in Nigeria, but lack of competitiveness limits the expansion of financial access and prevents the market players from extending the service to the underserved areas (Hernandez-Coss & Bun, 2006). Since competition brings about technological innovation, its presence will be beneficial to Nigeria. This has prompted the Minister of Communication to propose a post bank programme where the Nigerian Postal Service (NIPOST) will operate like banks. In this regard, the post office will be rendering financial services such as remittance transfers, which will improve financial inclusion since the post offices are closer to the grassroots than the banks. This will therefore make the remittance market more competitive as it will add to the number of existing players in the markets. The reduced cost of transfer that will follow the competition will ultimately increase the volume of remittances.

2.2.5. The Impact of the Financial Crisis on Remittances Inflow

Statistics show that migrant remittances have grown dramatically in Nigeria in the past decades, but little is known about the pattern of remittance in the country. Due to data limitation, it is very difficult to know which migrants remit, how much is remitted and how the size of remittances varies with level of education, gender, income level, status of the migrants abroad (whether documented or undocumented migrants) and duration of migrants' stay overseas (Bollard et al., 2010). This section provides a detailed examination of the remittance behaviour of Nigerian migrants before and after the global financial crisis.

Crises are common features of the global financial system. When there is a crisis, immigrants are more negatively affected than natives, particularly if the government has a strict migration policy. The global financial crisis of 2008, which originated in the USA, had an important if not catastrophic effect on developing countries and migrants. One of the major ways it was generally believed that this financial crisis would affect the developing countries is remittance. The crisis had a grave impact on the economy of the USA and Europe. There was a fall in consumer spending and many jobs were lost in the affected regions (World Bank, 2012). Like political crises, financial crises create environmental insecurities and migration is a strategic response. Since the 2008 crisis originated in advanced countries, the source of remittances for many developing countries, it was expected that remittance inflow into developing countries would fall drastically. However, remittance inflows have remained resilient (it has not changed much) compared to other foreign capital flows in some of the recipient countries, and Nigeria is no exception.

Table 2.4: Inflows of Remittance before and after the Global Financial Crisis (US$ billions)

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Remittance	16.9	18	19.2	18.3	19.8	20.6	21.9	23	20.8	21	19

Source World Bank, 2017.

In Nigeria, prior to 2008, remittance inflows were relatively stable but fell marginally towards late 2008 and in 2009. The inflows increased by 6.51 per cent and 6.67 per cent in 2007 and 2008 respectively (Table 2.4). It could be observed that even when the crisis started, the value of remittances did not fall. It was during the third quarter of 2008 that the crisis began to have a negative impact on the remittances and the size during the first and second quarters outweighed the fall in the latter part of the year (Ajakaiye & Fakiyesi, 2009). The effect of the crisis manifested on the remittance as the value dropped dramatically by 4.19 per cent in 2009. The migrant remittance quickly picked up the following year and ever since has been on the increase (Table 2.4).

Though remittances tend to be resilient to financial crises, the crisis still took a toll on the pattern in Nigeria, with micro and macro effects. It was through the micro effect that it impacted the remittance behaviour in Nigeria. At individual and household levels, most households in Nigeria have relations living abroad, and the crisis has changed the coping mechanisms of these individuals. Remittances are a source of income for most households in Nigeria and the migration of skilled and unskilled relations is considered as improvement in the economic well-being of such households. This is because it is generally believed that migrants will surely think about home. Apparently, the hardship crisis brought to the economy of the advanced countries affected the ability of the migrated workers to send home money (Achike & Ichoku, 2010).

The growth rate of remittances in Nigeria returned to normal shortly after the crisis because of the resilience of remittances. Among other explanations, broadly four factors were responsible for the resilience of migrant remittances to Nigeria. First, the destinations of Nigerian migrants are diversified, their presence is not limited to the USA, they spread across the European countries and some countries in Asia, so the shocks to the labour market in one country may not necessarily affect the flows of remittances to the country. Second, many Nigerian migrants did not return home despite limited employment opportunities because of the crisis. The migrants feared that if they returned home, it might be difficult to obtain visas if they wanted to go back and secure their jobs after the recovery.

Third, migrants from countries that were severely impacted by the crisis usually came with their savings; a form of inward remittances. This reduced the negative effect of the crisis on remittances. Lastly, there was a surge in the exchange rate of the naira against the dollar during the crisis (Sirkeci, Cohen & Can, 2012). The naira depreciated against the dollar from N120.71 to N161.64 between 2008 and 2009. This produced a sale effect on remittance behaviour of migrants in the USA as they considered goods and services as well as assets relatively cheaper at home (Nigeria) and affordable. This brought about a surge in investment-oriented remittances into the country. The financial crisis reduced employment opportunities in developed and developing countries, and for the first time since the 1980s, remittance inflows into Nigeria dropped in 2009 (CBN, 2013).

2.2.6. Eliciting Migrant Remittances for Investment in the Local Economy

As a source of household income in poor regions, monetary inflows sent home by migrants have a favourable impact on rebalancing growth by expanding domestic demand. Such a receipt also helps smoothen consumption and promotes human capital development by increasing the capacity of households to spend on education, health and nutrition. In addition, macro stability of recipient

economies can be enhanced by providing them with foreign exchange and improving their creditworthiness. This eases credit constraints and funding physical infrastructure is made possible, thus stimulating financial development and economic development.

Countries in Asia have invested remittances in their domestic economy to foster economic growth. This has been achieved by spurring entrepreneurial activity, improving labour productivity and stimulating consumption as well as investment demands with remittance inflow (Da Silva, Baker, Shepherd and Jenane, 2009).

In Nigeria, the same feat can be achieved to improve the development impact of remittances if relevant policy instruments are adopted which can enhance the flow of remittances through the formal channels. If the government's objective is to capture a portion of remittances for development purposes, taxes or levies on remittance transfer can be imposed. Also, transfers can be stimulated through the formal channels by focusing the policy instrument on the sale of remittance bonds, opening of foreign currency accounts, premium interest rate accounts, promoting transfers through microfinance institutions, promoting financial literacy and bank the unbanked (Da Silva et al., 2009). This process will make funds available to the government and private investors.

Remittances can be harnessed to stimulate investment in Nigeria if government reaches out to the migrants abroad through migrants' service bureaux and tax breaks on imported capital goods for migrants. This will provide the capital base and infrastructure that can promote investment and will bring about the desired economic growth and development in Nigeria.

Remittances have become a significant component of capital inflows into Nigeria. It is thus important that we examine the exchange rate types and foreign exchange management milieus in Nigeria.

2.3. FOREIGN EXCHANGE REGIMES IN NIGERIA

The link between remittances and the real exchange rate has recently received a lot of attention in the literature. The previous sections documented the effect of the upsurge in remittance inflows on the economy. In this section we briefly review the trends in the exchange rate in Nigeria in the past decades. Exchange rate policy in Nigeria has moved in a cycle, starting from a fixed exchange rate system from 1960 to 1986, a flexible exchange rate system from 1987 to 1993, a temporary halt to deregulation in 1994 when the official exchange rate was pegged, and the reversal of policy in 1995 with "guided deregulation" of the foreign exchange market (FEM), through exchange rate liberalisation and the institution of a dual exchange rate mechanism. The policy thrust of 1995 was maintained in 1996. The dual exchange rate system introduced in 1996 was retained in 1997 and 1998. All official transactions, except those approved by the Head of State, were undertaken in the

autonomous foreign exchange market (AFEM). Thus, transactions at the pegged official exchange rate were relatively slimmer. Owing to market imperfections and sustained instability in the exchange rate of the naira, the AFEM was replaced with an inter-bank foreign exchange market (IFEM) in October 1999 after an initial period of coexistence. In the IFEM, a two-way quote system was expected to prevail while the market was conducted daily. Oil companies were allowed to keep their foreign exchange in banks of their choice, against the pre-funds with the Central Bank of Nigeria (CBN). The CBN has continued to fine-tune the IFEM to make it more effective and efficient. Early in 2002, Thomas Cook was granted permission to transact foreign exchange business on travellers cheques (TC) in Nigeria. This was intended to deepen the foreign exchange market and reduce the undesirable impact of the parallel market.

2.3.1. Era of Exchange Control

Various measures were adopted to operate the fixed exchange rate system that replaced the exchange control era. Between 1960 and 1972, the Nigerian currency was pegged to the British pound sterling. Although the parity between the Nigerian and British currencies was maintained, the Nigerian authorities operated an independent exchange rate system from 1967, when the pound sterling ceased to serve as a direct external anchor to the Nigerian currency. While the pound was devalued, the Nigerian currency was implicitly revalued since it maintained its former parities. From this period, the monetary authorities introduced the US dollar as one of the reference currencies for determining the exchange rate of the Nigerian pound. As the nation continued to lose reserves due to excessive importation and rapid outflow of foreign exchange, a policy reversal occurred in 1981 to arrest the deteriorating external sector position. The overvaluation of the naira was recognised by the authorities and it was gradually depreciated to stem the outflow of foreign exchange through the curtailment of import demand. The policy was sustained up to 1986 but did not reverse the deterioration of the sector. The situation became worse with the continuous accumulation of payments arrears and the erosion of the nation's creditworthiness. The CBN applied the basket of commodities approach from 1987 as a guide to determine the direction of exchange rate movement.

2.3.2. The Era of Flexible Exchange Rates

A major reversal of policy was effected in September 1986 when the fixed exchange rate mechanism for determining the naira exchange rate was discarded and replaced with a flexible exchange rate mechanism. The system was propelled by market force, as the naira was allowed to find its level according to the strengths of demand and supply of foreign exchange. Meanwhile, the monetary authorities retained the discretion to intervene in the FEM to influence the course of exchange rate movement to achieve the aim of policy.

Within the main framework of exchange rate determination, various methods have been applied in the search for a realistic exchange rate of the naira. On September 26, 1986, the naira was floated in the second-tier foreign exchange market (SFEM) where market force held sway. A dual exchange rate mechanism was in operation during this period since a first-tier rate was in existence. The first-tier rate was a carry-over of the fixed exchange rate system. The rate was less depreciated since it was administratively determined.

The dual exchange rate system was meant to accommodate traditional transactions and prevent the destabilising effects of a full-scale adoption of the market mechanism. Pre-SFEM transactions, debt services payments contributions to international organisations, and expenses of embassies were excluded from SFEM and settled at the first-tier rate. The second-tier rate was determined through action at the SFEM. Various pricing methods used to determine the naira exchange included, in the following order, average of successful bids, marginal rate pricing, and the Dutch auction system (DAS) in April 1987.

The first and second-tier markets were merged into a single FEM in July 1987. The AFEM created in 1988 was highly destabilising due to its speculative tendencies. The autonomous market was merged with the FEM in January 1989 when the IFEM was created. The exchange rate under the IFEM was determined through one or more of the following: marginal rate pricing, average rate pricing, highest and lowest bid and weighted average pricing, average of successful bids. In addition, the CBN could monitor developments in the exchange rate of the major international currencies as a guide in ascertaining the desirable level of the naira exchange rate. The IFEM was modified in December 1990 when the DAS was reintroduced. In August 1991, the modal weighted average method was introduced to stem the rapid depreciation of the naira. The rates tending towards the mode were applied to determine the naira exchange rate under the system.

The persistent instability in the IFEM even after the introduction of the model weighted average method resulted in the complete floating of the naira from March 5, 1992. The instability reflected in the widening parallel market premium. To eliminate the premium at the time, the CBN adjusted the official exchange rate to correspond with the parallel market exchange rate. Under the new system, the CBN undertook to meet all demands for foreign exchange fully backed by naira cover. The CBN continued to satisfy all demands made on it until reserves became drastically depleted, necessitating the suspension of sales of foreign exchange by the CBN on December 15, 1992.

Sales resumed on January 12, 1993, but the next auction on February 18, 1993 was based on the DAS. The naira depreciated successively, and the DAS auction of February 24, 1993 represented a sharp

depreciation. The results of the session had to be cancelled. The CBN thereafter adopted the pro-rata system of foreign exchange allocation, thus ensuring that all demand for foreign exchange was at least partly satisfied. The naira exchange rate appreciated successively in the next two biddings and from April 15, 1993 the rate stabilised at NGN 21.86:1 USD on an average. The de facto pegging of the official exchange rate in the last three quarters of 1993 and the persistent depreciation of the parallel market exchange rate resulted in the widening of the parallel market premium beyond 100 per cent.

2.3.3. Regulation of Exchange Rates

The de facto pegging of the official exchange rate was sanctioned when the naira was officially pegged at NGN 21.9960: 1USD in the 1994 Budget. The parallel market was declared illegal, with indication that relevant laws would be made to outlaw it. However, some import control measures were introduced, such as the banning of the use of open accounts and bills for collection, the completion of form 'M' for all imports, and pre-shipment inspection for imports worth over US1,000 dollars. No attempt was made to stringently control current account transactions. To that extent, the exchange controls introduced under the 1994 Budget were not as stringent as the exchange control under the 1962 Act. Mandatory quantitative and value restrictions on the demand side were absent. The allocation of foreign exchange was on a pro-rata basis like the system in operation up to December 1993, while the exchange rate was at the same level. The only difference was the announcement of a reversal of policy to a fixed exchange-rate regime.

The review of the exchange-rate system was informed by the desire of government to stabilise the naira exchange rate in the short term, while appropriate measures were put in place to strengthen the naira in the medium to long term. Apart from fixing the exchange rate, interest rates were also pegged in the 1994 Budget. The rationale for this was the need to reduce the cost of production and moderate the rate of inflation. Under the fixed exchange rate system, allocation was determined by the demand made by end users and the supply of foreign exchange by the CBN. Given that supply was low and relatively fixed, the demand for foreign exchange was the most crucial variable determining the share of supply going to individual end users under the pro rata system of allocation.

2.3.4. Return of Flexible Exchange Rates under Guided Deregulation of the Foreign Exchange Market

The re-regulation of exchange rates in 1994 left the economy worse off than in the previous year. The policy objectives could not be realised as the naira depreciated sharply in the parallel market, widening the parallel market premium; hence, stability in the exchange rate and the FEM proved

elusive, the balance of payments remained under intense pressure, non-oil receipts declined, demand for foreign exchange assumed an upward pressure and became unsustainable in the face of relatively low level of supply of foreign exchange, which exacerbated the inflationary spiral and poor domestic output performance. In fact, all macroeconomic variables performed dismally. This informed the policy reversal in 1995 from regulation to a liberalised framework of "guided deregulation" of the FEM. Under the new policy, the centralisation of all foreign exchange receipts in the CBN was jettisoned. Bureaux de change were once more allowed to buy and sell foreign exchange, as the 1994 policy which restricted them to buying agents of CBN was discontinued. The major element of the deregulation was the reintroduction of the AFEM for disbursing foreign exchange to end-users through selected banks. A subsidised and pegged official exchange rate of $1.00 to N22.00 was reserved for public-sector transactions or non-commercialised agencies, including debt services payments and national priority projects. Transactions eligible for financing through the concessionary official exchange rate were verified by the Federal Minister of Finance. The distinguishing features of the new AFEM vis-à-vis the one abolished in 1989 were the enlarged institutional scope and the prohibition of inter-bank dealings with official intervention funds in the market. In the pre-1989 dispensation, the autonomous market was mainly an inter-bank market and the official foreign exchange was eligible for transactions in the market.

The goals of the foreign exchange and exchange rate policy for 1995 were the deliberate build-up of external reserves to improve the creditworthiness of the Nigerian economy and its competitiveness, strengthening of the naira to gradually move the currency towards convertibility. The CBN's foreign exchange holdings were deployed to build up reserves, finance priority public sector transactions including debt services payments, and for intervention in the FEM to ensure reasonable stability in exchange rates.

The AFEM was expected to reduce the parallel market premium and eventually ensure the convergence of the various exchange rates in a single and enlarged FEM. It was therefore expected to stabilise the naira exchange rate, induce increases in non-oil export receipts and reduce excessive demand pressures in the FEM. To address the supply problems in the AFEM and prevent exchange rate volatility, the CBN intervened in the market as it deemed fit, selling foreign exchange to end users through selected authorised dealers. The CBN could also buy foreign exchange from the AFEM to stabilise exchange rates as situations demanded.

Other measures introduced in 1995 to ensure smooth functioning of the AFEM were the abrogation of the Exchange Control Act of 1962 and the Enterprises Promotion Decree of 1989, as well as the permission granted exporters to sell their proceeds at autonomous rates to banks other than those in

which they maintained domiciliary accounts. The exchange rate policy was maintained in 1996. The dual exchange rate system was retained, while the Central Bank's discretionary intervention in the AFEM was regulated through the directive that the Bank should intervene monthly in the AFEM in 1996. As at October 1999, the Central Bank intervened weekly in the AFEM.

Although some macroeconomic aggregates showed improvement in 1995 vis-à-vis their performance in 1994, the inflation rate continued to trend upwards, while the external sector remained under considerable pressure. The exchange rate stabilised at the AFEM with the exchange rate hovering around N80 = $1.00 and N85 = $1.00. The divergence between AFEM and the parallel market exchange rate was below the tolerable limit of five per cent in 1995, an indication of convergence. The situation improved further in 1996 and 1997. Monetary stability was maintained while the fiscal operations of government resulted in an enlarged surplus. The divergence between the AFEM and parallel market exchange rate fell below five per cent on average in 1997. This would have been sustained through the continuous applications of accommodating monetary and fiscal policy measures. Although some stability was attained in the AFEM at the end of 1997, the naira was overvalued, going by the purchasing power parity (PPP) rate of a little above N88 = $1.00. Thus, the exchange rate of the naira since the introduction of the AFEM was largely realistic and has been within the limits of the long-run equilibrium exchange rate depicted by the PPP. Trends in the IFEM and developments in domestic prices indicated that the naira was overvalued. The initial undervaluation of the naira and stability achieved when IFEM was introduced in October 1999 reflected by the narrowing of the parallel market premium have been reversed owing to several factors. The imperfections in the IFEM, which the CBN had sought to address, weighed in heavily. For instance, the IFEM was designed as a two-way quote system where the CBN could sell and buy foreign exchange. In practice, the CBN has been the major seller with little foreign exchange to buy from the market. The sharp practices by market operators in the form of inflated round tripping have not helped the situation. The upward trend in domestic prices led to a situation where the PPP rate virtually coincided with the parallel market exchange rate in January, 2002.

The dual exchange rate system was retained in 1997 and 1998 but its operation was modified in 1998. Unlike in the past, all ministries and parastatals sourced their foreign exchange needs from the AFEM, thus most of the foreign exchange transactions were conducted at the AFEM. The pegged official exchange rate was applicable to only a small proportion of foreign exchange transactions. Therefore the unification of exchange rates could be accomplished, provided market operators exercised willingness through prudent fiscal operations and elimination of sharp practices.

A managed floating exchange rate regime, without any strong commitment to defending any particular parity, has been the most predominant of the floating system in Nigeria since the SAP. Following the failures of the variants of the flexible exchange rate mechanism AFEM introduced in 1995, and the IFEM in 1999 to ensure exchange rate stability, the DAS was reintroduced on July 22, 2002. The DAS was to serve the triple purposes of reducing the parallel market premium, conserving the dwindling external reserves, and achieving a realistic exchange rate for the naira. The DAS helped to stabilise the naira exchange rate, reduce the widening premium, conserve external reserves, and minimise speculative tendencies of authorised dealers. Retail DAS was implemented in the first instance with CBN selling to end users through the authorised users (banks).

2.3.5. The Retail and Wholesale and Dutch Auction System

Encouraged by the rise in Nigeria's external reserves position, the consolidation-induced banking soundness, and the enhanced fiscal discipline observed by the end of 2005, the CBN on the 20th February, 2006 moved from the retail Dutch auction system (RDAS) to the wholesale Dutch auction system (WDAS) as the mechanism for exchange rate determination. The transition was part of the sequencing of the financial sector reforms, and to further liberalise the foreign exchange market by dismantling vestiges of controls on foreign exchange transactions. The WDAS was introduced against the background of widening gaps between the parallel and official exchange rates, and high demand for foreign exchange. The WDAS was introduced to further liberalise and develop the foreign exchange market in order to facilitate the convertibility of the naira, achieve exchange rate unification between the official and inter-bank markets, facilitate greater market-determined exchange rates for the naira, and promote an efficient and smoothly functioning foreign exchange market. RDAS was re-implemented in January 2009, following a decline in external reserves because of the global financial crisis. However, WDAS was reintroduced in July 2009 with the improvement in the revenue from crude oil exports.

The RDAS was reintroduced in September 2013 and was in operation until February 18, 2015 when the window was again closed. The Central Bank of Nigeria now intervenes at the interbank segment of the foreign exchange market. The CBN took this action to minimise problems of expanding arbitrage and multiple exchange rate regimes, and conserve foreign exchange reserves.

In November 2014, the CBN responded to the dwindling oil price and, by implication, dwindling foreign reserves by adjusting the central official value from N155 to N168 per dollar (8.39%), and expanding the band from plus or minus three per cent to plus or minus five per cent. This was expected

to help reduce the demand pressures on the naira, thereby slowing down the rate of external reserves depletion.

2.3.6. Recent Development in Foreign Exchange Management in Nigeria

The Nigerian government embarked on a significant change in the exchange rate on February 17, 2015. The CBN closed the retail Dutch/wholesale DAS segment of the FEM and quoted an exchange market of NGN 198/USD 1.00 as the official selling rate, connoting a de facto devaluation at the interbank foreign exchange market (FX) market.

The CBN, in scrapping its window of direct sale of foreign exchange to end users on February 18, 2015, stated that all foreign exchange needed to be sourced from the interbank market, whose rate ranges between N197 and N198 to a dollar. This implies that Nigerians who need foreign exchange must approach their bank and buy at the ruling rate. The government later floated the exchange rate on June 20, 2016. This has resulted in a change in the value of the currency in the formal (interbank) and informal market (BDC). It is expected that flexibility in the foreign exchange market will lead to a quasi-instantaneous convergence of the rate in both markets. This was not the case during the first month as the formal and informal market rates remained significantly different. This may be partly explained by the adjustment to the new regime. As seen in Figure 2.8, a measure of convergence at about NGN360 : 1USD has been achieved in the foreign exchange market owing to sustained interventions by the Central Bank.

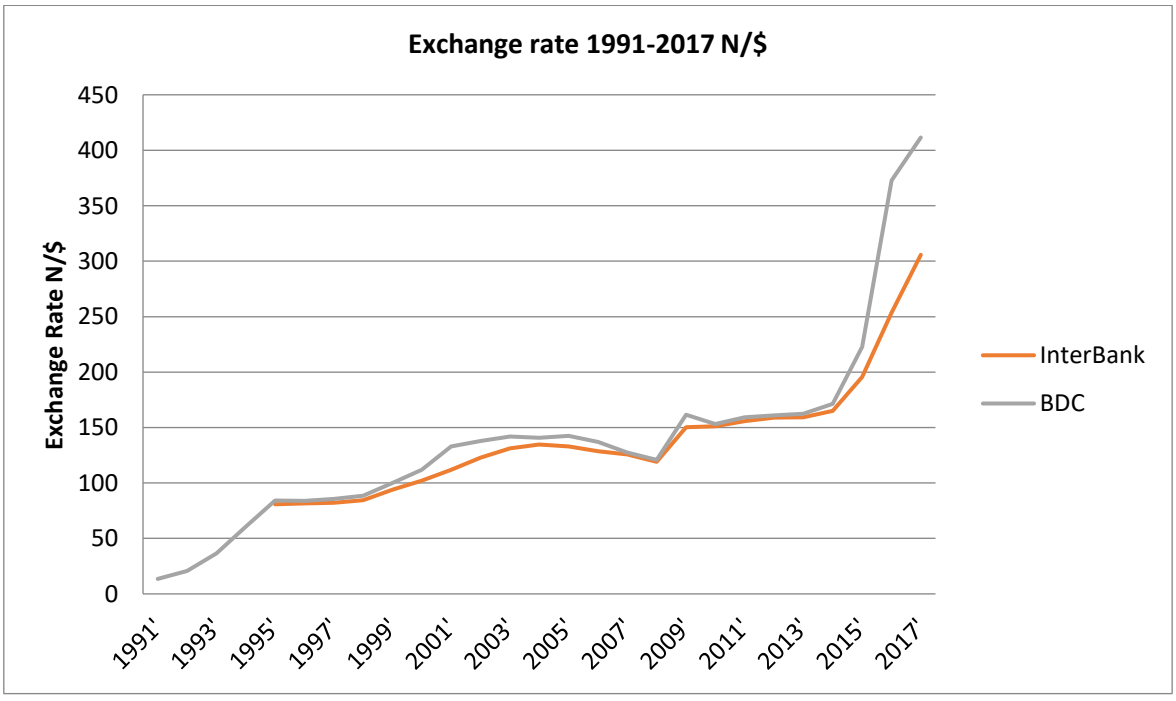


Figure 2.9: Exchange Rates 1991–2017 N/USD
Source: Central Bank of Nigeria.

2.4. SECTORAL PERFORMANCE AND EXCHANGE RATE IN NIGERIA

The Nigerian economy is classified into five interrelated sectors: agriculture, industry, construction, trade and services (CBN, 2016). Some of these sectors have contributed to the national output and government revenue at different points in time. The agricultural sector comprises four subsectors which cut across crop production, livestock, fisheries and forestry. The industry revolves around mining and quarrying, crude petroleum and manufacturing subsectors. Building and construction as well as the wholesale and retail trade have no subsectors, while the service sector has the highest number of subsectors. The service subsectors include transport, communication, utilities, hotel and restaurant, finance and insurance, real estate and business services; producers of government services as well as commercial, social and personal services. The outputs of these various sectors are affected by the movement in the exchange rate. The manufacturing sub-sector's contribution to the Nigerian economy is limited by the fluctuation in the exchange rate because most of the inputs used in production in this sub-sector are imported; therefore, the depreciation of the Nigerian currency increases the cost of production in this sub-sector.

Prior to the 1970s, agriculture was the mainstay of the economy (Sertoğlu, Ugural & Bekun, 2017), but following the discovery of oil in commercial quantity and the importance of oil in the international market, the petroleum industry has become the dominant industry in the economy for government revenue and foreign exchange earnings, strengthening the link between the foreign exchange earnings, mostly the US dollars, and the performance of various sectors of the Nigerian economy. These strong interconnections, especially of those sectors that rely on foreign input and have weak capacity to generate the necessary foreign exchange, usually subject the economy to vulnerability in the inflow of foreign earnings and the price of crude oil in the international market.

Fluctuations in exchange rate affect the cost of production in the various sectors of the economy. It is therefore not surprising that the exchange rate is among the most watched, analysed and government manipulated macroeconomic indicators as it plays a vital role in a country's level of trade, which is critical for every free market economy in the world. Most countries strive to moderate their domestic currency fluctuations by imposing restrictions on exchange rate movements (Ngerebo-A & Ibe, 2013). It is a key macroeconomic measure in the context of general reform programmes and because of its importance, government takes an active part in its determination. Specifically, it is important as the connection between the price systems of countries, as a price in the allocation of real resources among tradable and non-tradable sectors, as a promoter or otherwise of imports and exports, and as an instrument in the design of the balance of payment programme of countries.

2.4.1. Trends in the Real Sector in Nigeria: Agriculture and Manufacturing

2.4.1.1. Agriculture Sector

In Nigeria, the agricultural sector has played a crucial role in the economic development, most especially before the discovery of oil in commercial quantities in the 1970s. This is because Nigeria is blessed with an abundant land mass that is fertile for agricultural purposes (Federal Ministry of Agriculture and Rural Development, 2000). However, it still contributes significantly to the total output: the sector contributed more than 20 per cent on average. It is seen in Figure 2.9 that the contribution of agriculture to GDP rose gradually from 11.8 per cent in 1981 to 29.5 per cent in 1997. This coincides with the period when the exchange rate was liberalised and relatively stable. More importantly, the significant increase in the share of agriculture to total output can be attributed to the government's committed effort towards food security.

In a bid to boost agricultural production during the 1980s the government introduced an incentive scheme by charging concessional interest rates on agricultural facilities until 1992. Also, during this period, the agricultural sector was highlighted as one of the government priority sectors; hence commercial banks were mandated to ensure that a certain percentage of their deposits were issued as a loan to the sector (Kumar, 2011). Furthermore, the growth rate of the sector output oscillates around 20 per cent. This reflects that the sector's total output has been on the increase. This impressive feat can also be attributed to the Green Revolution Programme initiated by the government between 1980 and 1983. The programme was aimed at ensuring that Nigeria is self-sufficient in food production. The drive for a self-sufficient economy in food production led to the establishment of three Federal Universities of Agriculture in 1988 with the intention of boosting the human capacity required for the advancement of the sector.

Post-2000, the share of the agricultural sector to GDP has been on the decline. It fell from 37.5 per cent in 2002 to 26.3 per cent in 2009 and then fell further to 20.2 per cent in 2014 before increasing slightly to 21.2 per cent in 2016. The periods of decline in the share of agriculture to total GDP coincide with the periods of rising exchange rate and a slow-down in the growth rate of the sector output. A rising exchange rate might be associated with the high cost of importation of farm implements, thus increasing the overall cost of production. Other factors such as the poor road network might account for the drop in the sector share in total output as well as the decline in the growth rate.

The agricultural sub-sector is one of the major sectors in the economy and a key determinant of long-run economic development in Nigeria, with the sub-sector contributing to the development of an

economy through production of goods, foreign exchange and exports (Ajudua, Davis & Osmond, 2015). Just like the manufacturing sector, agricultural output also exhibits fluctuation. The average growth of agricultural output was 23.68 per cent in the 1980s and 36.08 per cent in the 1990s. The high growth witnessed in the 1990s was due to direct involvement of the Nigerian government in boosting the agricultural sub-sector with several large-scale agricultural projects and programmes launched and established, while a concessionary interest rate structure was employed with direct cheap credit to the agricultural sub-sector (Ajudua et al., 2015).

The contribution of agriculture to the GDP fell between 2000 and 2009 as 18.56 per cent was reported on average during this period. From 2010 the rate has been fluctuating around 12 per cent. From Figure 2.10 it can be seen that despite various policies and schemes the government implemented during the democratic regime, much has not been achieved in terms of growth in output of the sub-sector. The policies include the National Economic Empowerment and Development Strategy (NEEDS) launched in 1999, the National Special Programme on Food Security (NSPFS) launched in 2002, the Root and Tuber Expansion Programme (RTEP) launched in 2003, the Seven-point Agenda of 2007, the Transformation Agenda of 2011 and the Change Agenda of 2015.

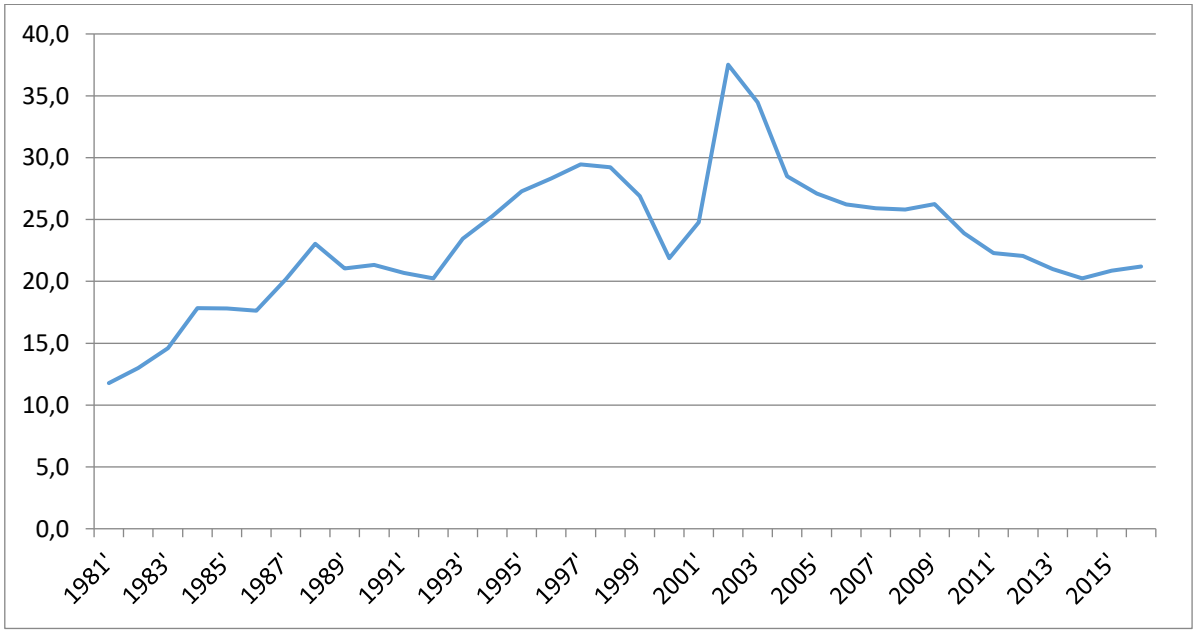


Figure 2.10: Agriculture Sector Contribution to GDP
Source: CBN Statistical Bulletin, 2016.

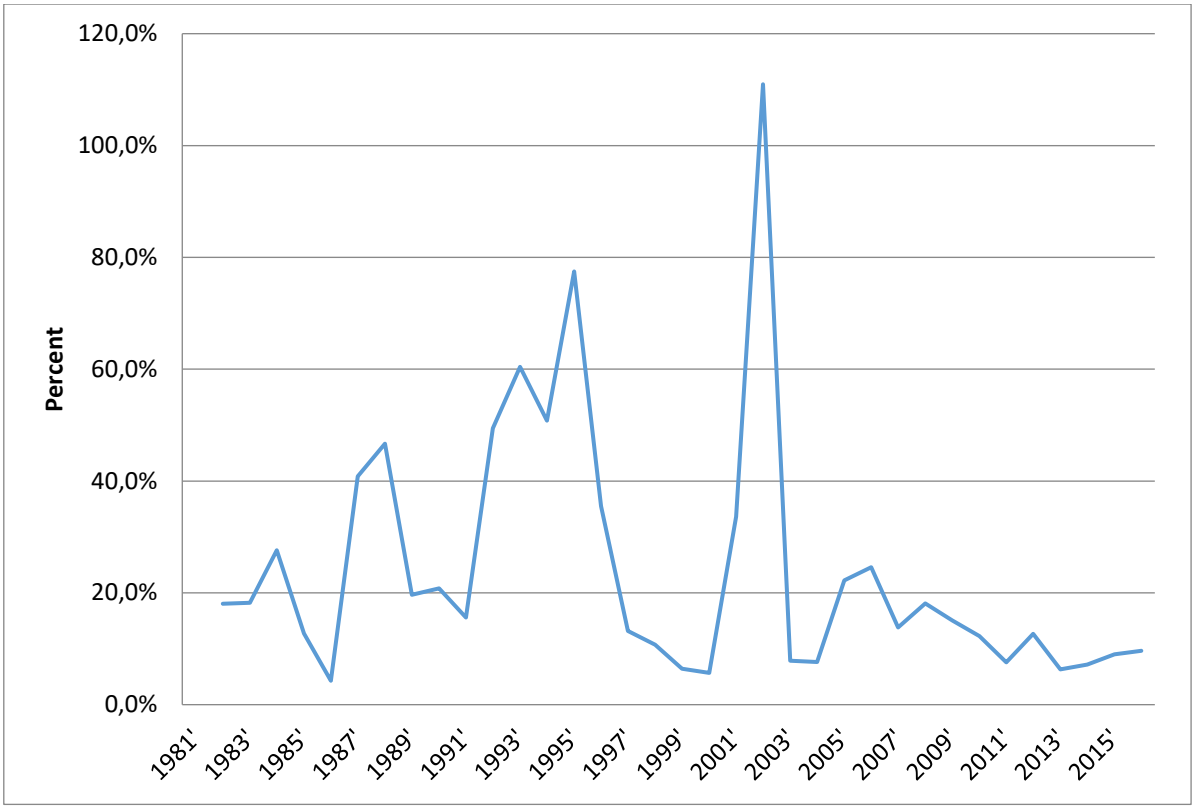


Figure 2.11: Agriculture Sector GDP Growth Rate (%)
Source: CBN Statistical Bulletin, 2016.

2.4.1.2. Crude Oil & Solid Minerals

Apart from the agricultural sector, the crude oil and solid minerals sector is another primary sector in Nigeria. This sector shapes the economic and the political landscape in the country. The significance of the sector can be traced to the discovery of crude oil in commercial quantities in the early 1970s (Odularu, 2008). Figure 2.11 shows that on average crude oil and solid minerals contributed approximately ten per cent of the GDP. On a closer look, the performance of the sector experienced significant improvement during 1983 to 1991. It rose gradually from 4.9 per cent in 1983 to 16.5 per cent in 1992. The share of the sector in 1992 is less than three times of the sector share in 1983. The significant increase recorded can be associated with the depreciation of the naira against the dollar after the liberalisation of the exchange rate in the mid-1980s. This is because the depreciation of the exchange rate leads to an increase in the amount realised as proceeds from both crude oil and solid minerals.

The share of the sector in total output declined by 100 per cent. It fell from 16.5 per cent in 1992 to 7.5 per cent in 1994. While the liberalisation of the exchange rate led to initial improvement of the sector, it later hurt the sector. This is because the weak nature of the country's currency against the dollar increases the cost of operation as the sector is import dependent in terms of equipment, thus

reducing the capacity of the sector. The implication is that the crude oil and solid minerals sector output is affected more when compared to the other sectors of the economy that rely less on imported input, such as agriculture.

Due to the adverse consequence of the continuous depreciation of the naira against the dollar after the liberalisation of the exchange rate, the government then adopted a fixed exchange rate management approach in 1994 which was ceased in 1997. During the period, the sector recorded the highest growth rate in 1995, while the share of the sector to GDP increased drastically until 1996 before it began to decrease, a trend similar to what was observed in terms of the growth rate of the sector. Thus, it is evident that the performance of the sector is partially influenced by the exchange rate.

Over the last decade, the performance of the sector has not been impressive. The share of crude oil and solid minerals declined from 14.8 per cent in 2005 to 13.6 per cent in 2008 and then fell further to 9.8 per cent in 2009. As the world economy recovered from the 2007/2008 financial crisis, the demand for crude oil increased, so the share of the crude oil and solid minerals sector also experienced an increase until 2011. After 2011, the contribution of the sector declined continually from 17.6 per cent in 2011 to as low as 5.4 in 2016. The poor performance of the sector is also reflected in the growth rate over the same period. The poor performance can be attributed to factors such as the explosive exchange rate, a fall in the oil price, and disruption of activities within the Niger-Delta by militants (Odularu, 2008; Akinlo, 2012).

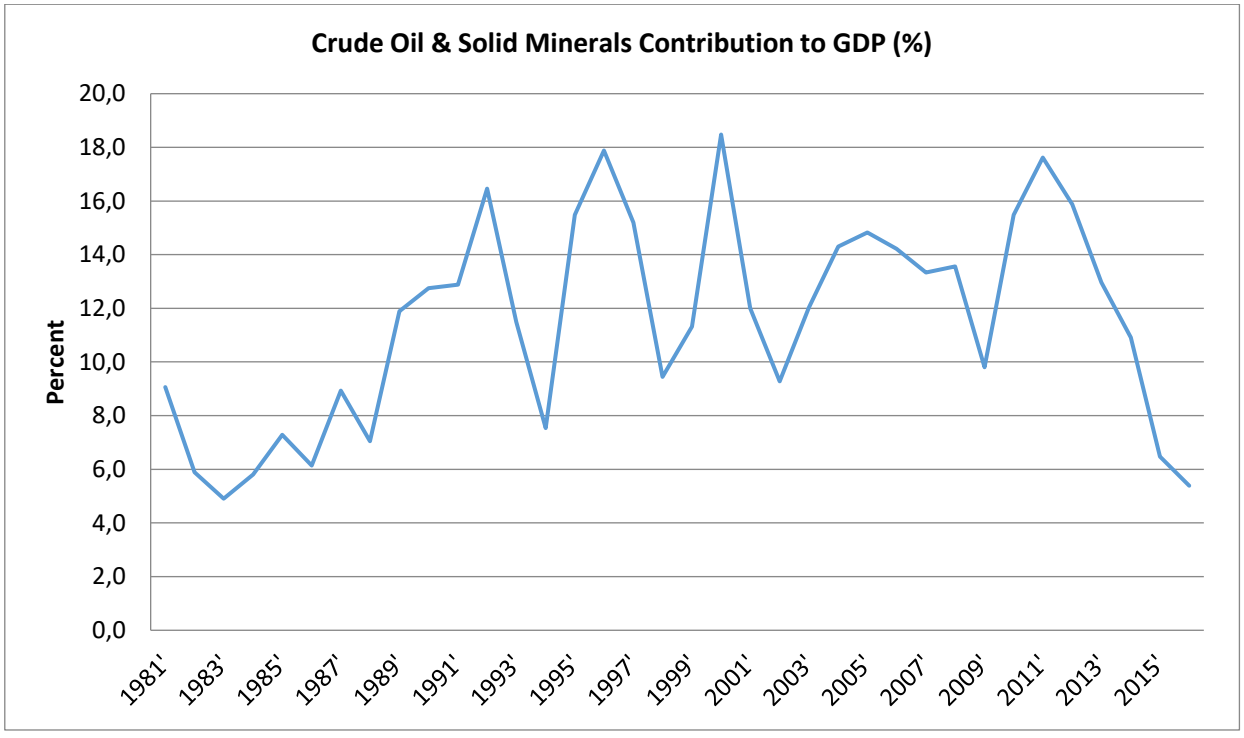


Figure 2.12: Crude Oil & Solid Minerals Contribution to GDP (%)
Source: CBN Statistical Bulletin, 2016.

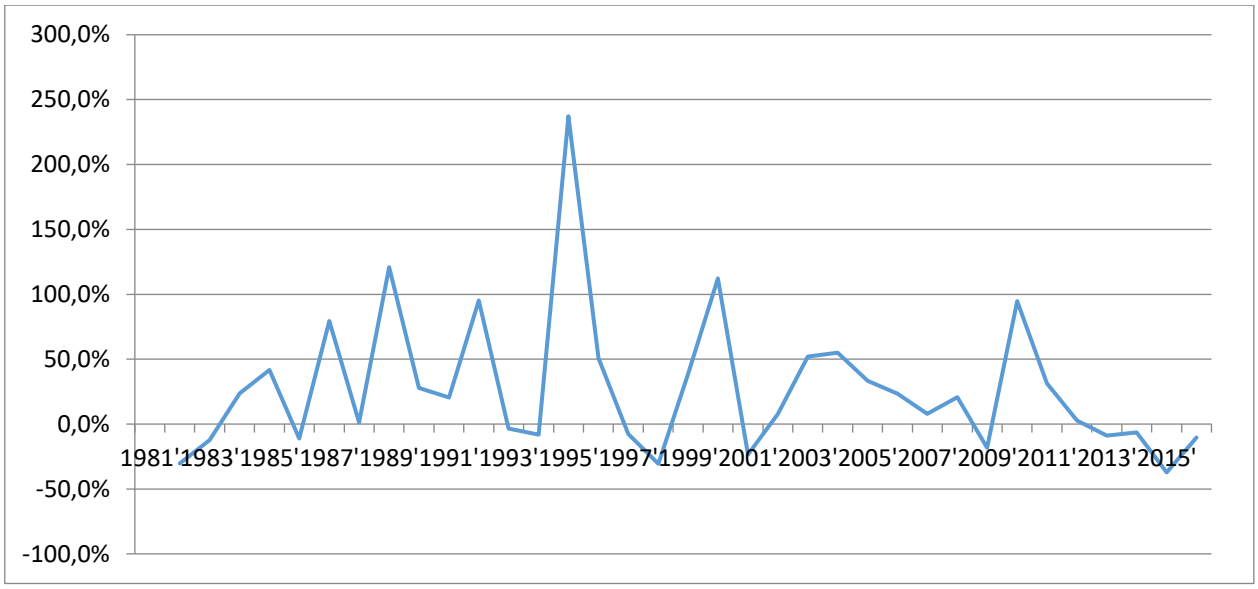


Figure 2.13: Crude Oil & Solid Minerals GDP Growth Rate (%)
Source: CBN Statistical Bulletin, 2016.

2.4.1.3. Manufacturing

Prior to the GDP rebasing of 2013, the Nigerian manufacturing sector consisted of oil refining, cement and other manufacturing. The sectoral data has since then been expanded and now captures oil refining, cement, food, beverage and tobacco, textile, apparel and footwear, wood and wood products, pulp, paper and paper products, chemical and pharmaceutical products as well as non-metallic products.

The manufacturing sector plays an accelerating role in a modern economy and has many dynamic benefits that are crucial for economic transformation. It has the tendency to increase productivity in relation to import substitution and export expansion, bring in foreign exchange earnings, raise employment, and promote faster growth (Fakiyesi & Akano, 2005). In Nigeria this has not been the case. It has made a minimal contribution to the national output and export for decades due to lack of infrastructural support, high interest rates on loan facilities, low-quality output, reliance on foreign inputs, over-reliance on oil, and policy instability. The dependence on crude oil and neglect of the other sectors which exposed the economy to external shock, unstable government revenue inflow and foreign exchange shortage have also retarded the sector.

The distortion of the foreign exchange market (moving from a fixed to flexible exchange rate regime) resulting from the SAP of 1986 marked the beginning of the uncertainty in the manufacturing sector.

Since the introduction of the second-tier foreign exchange market (SFEM) in 1986, the naira has been on a downward spiral (leading to about 49.7% in devaluation by 1987). This caused a downward slide in the contribution of the manufacturing sector to total economic output in Nigeria in the late 1980s (NBS, 2014), which is partly due to the over-dependence of the sector on the external sector for the import of non-labour input (Edeane, 1993). The authority responded by merging the first and second-tier markets into an enlarged foreign exchange market (FEM) in 1987 and introducing the inter-bank foreign exchange market (IFEM) in January 1987, yet the market remained unstable. Although there were spikes of growth in the sector in 1985, 1988, and 1993, they were never sustained. They were short-lived due to inadequate availability of foreign exchange. With the rebasing of the GDP data in 2014, the manufacturing sector has shown a slight progressive trend, but still has an average of 46.6 per cent capacity utilisation from 2003 to 2013. As recession set in from 2015 to 2016, the exchange rate policy has become more unstable. The central bank set limits on foreign exchange allocations. About 41 items (some crucial to the manufacturing sector as inputs) were excluded from the official forex window. Some of these directly affected the manufacturing sector, since about 60 per cent of raw materials for manufacturing are imported.

In the mining and quarrying sector, economic potentials have not been fully harnessed. The fortunes of solid minerals declined significantly following the rising profile of crude petroleum in the 1970s. Mining sites were abandoned as crude petroleum provided a cheaper source of energy and government revenue. Consequently, infrastructure at the mining sites deteriorated due to neglect. The potential of solid minerals therefore remained largely underdeveloped, which compelled the manufacturing sub-sector to depend on importation of minerals that otherwise would have been produced locally.

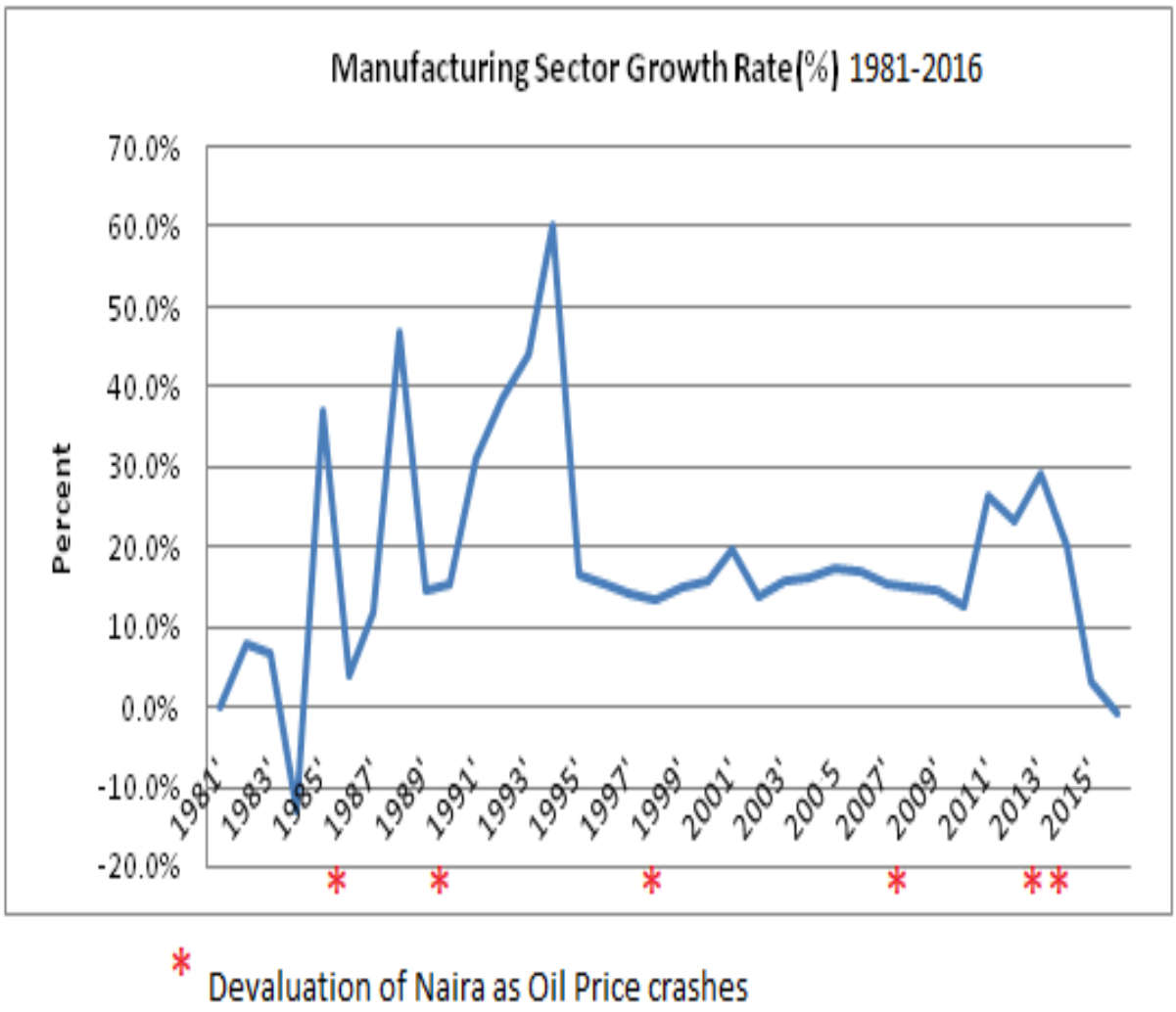


Figure 2.14: Manufacturing Sector GDP Growth Rate (%)
Source: CBN Statistical Bulletin, 2016.

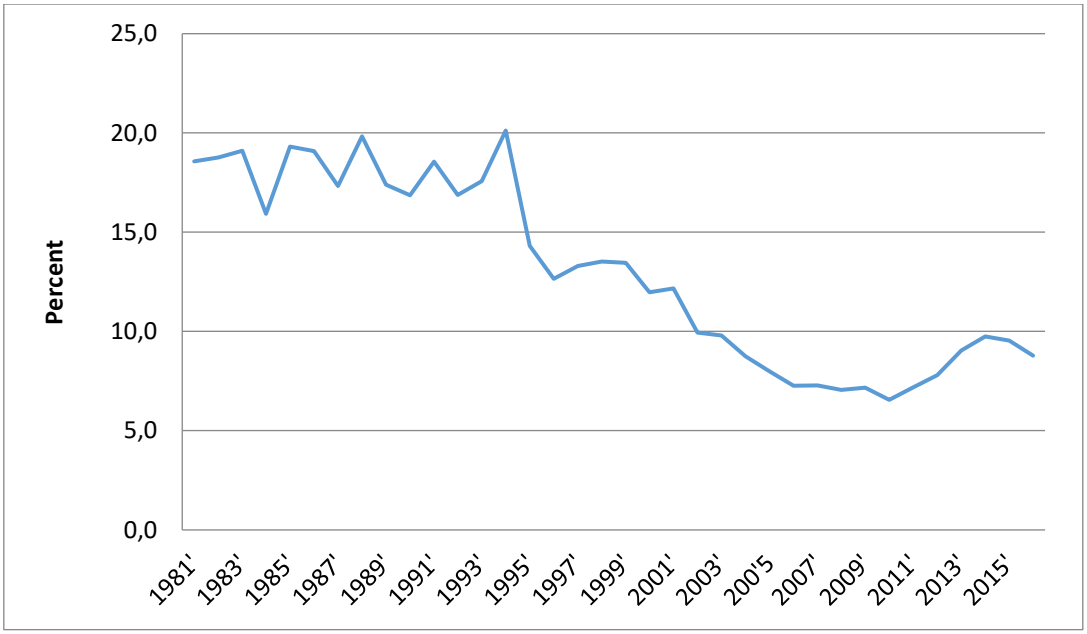


Figure 2.15: Manufacturing Sector Contribution to GDP (%)
Source: CBN Statistical Bulletin, 2016.

2.4.1.4. Construction

To achieve national and economic development, the role of the construction section cannot be overemphasised (Opaluwa, 2008). The sector's activities are comprised of residential and non-residential construction. The sector is directly related to the level of income in an economy. When the economy is booming, construction activities will be on the rise and vice versa.

From Figure 2.14, it is seen that over the period of 1981 to 1996 the contribution of the sector to the total output was on a declining path. Thus, during this period the economy was severely affected by the crash in the world oil price. Specifically, it declined from 7.6 per cent in 1981 to 3.2 per cent in 1985 and then declined further to 1.7 per cent in 1996, before stabilising around 1.9 per cent between 1997 and 2006. After 2007 it was observed that the contribution of the construction sector to the total output increased until 2015 before declining slightly in 2016. These periods coincide with when the economy recorded an impressive average growth rate of six per cent.

Although the sector inputs are imported and should be adversely affected by the changes in the exchange rate, the pattern of the sector performance revealed that the sector is least affected by the exchange rate compared to what was observed in the agricultural sector, the manufacturing sector and the crude oil and solid minerals sector. This might be because the activities carried out involve the rendering of services that support other sectors of the economy. Thus, the sector activities rely on the country's economic outcome. Clear evidence of this is the growth rate of the sector output during the

harsh economic periods of 1981 to 1986, although, on average, the sector recorded a positive growth rate. The implication of this is that over the period of 1987 until 2016, as depicted in Figure 2.17, the sector output has been growing.

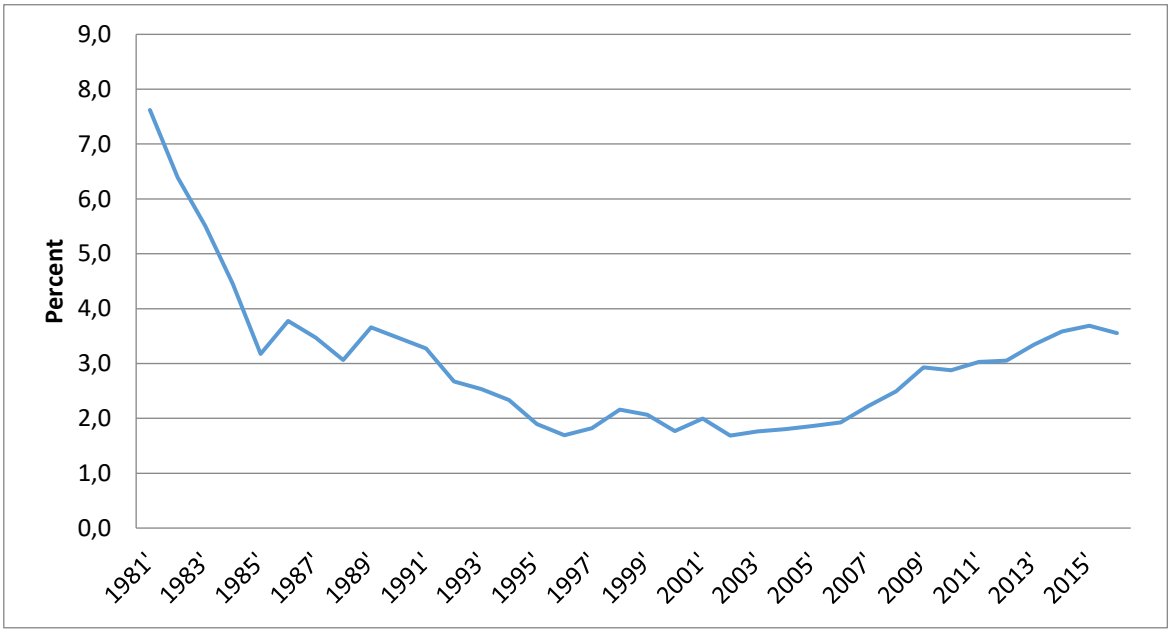


Figure 2.16: Construction Sector contribution to GDP (%)
Source: CBN Statistical Bulletin, 2016.

Figure 2.17: Construction Sector Growth Rate (%)
Source: CBN Statistical Bulletin, 2016.

2.4.2. Trends in the Services Sector in Nigeria

The constituents of the services sector in Nigeria include trade, information and communication, real estate, public administration, professional, scientific and technical services and financial institutions. The services sector has emerged as a dynamic sector whose importance has continued to rise in terms of growth rate and contribution to GDP. Over the years, the growth rate of the sector has been positive and from 1981 to 1988 it was around 7.86 per cent on average before it rose sharply to 43.75 per cent in 1989 (Figure 2.11). It fell in 1990 to as low as 3.01 per cent before it picked up the following year and witnessed a steady growth from 1991 to 1994, where it had the highest growth rate of 51.26 per cent (Figure 2.18). The high growth was largely attributable to improvement in transportation services. The establishment of the mass transit system that year and the increased flow of people and goods resulted in enhanced productivity (Oyejide & Bankole, 2001). Another stability was witnessed between 1996 and 2003 as the rate oscillated around 20 per cent during the period. There was an upward trend between 2003 and 2006 owing to the expansion in telecommunication services. The Global System of Mobile Communication (GSM) was introduced in Nigeria in 2001. Telecommunication not only led to an increase in the tele-density, it also led to improvement in the productivity of other services. Growth in the sector stabilised at an average growth of 13.29 per cent from 2007 to 2013.

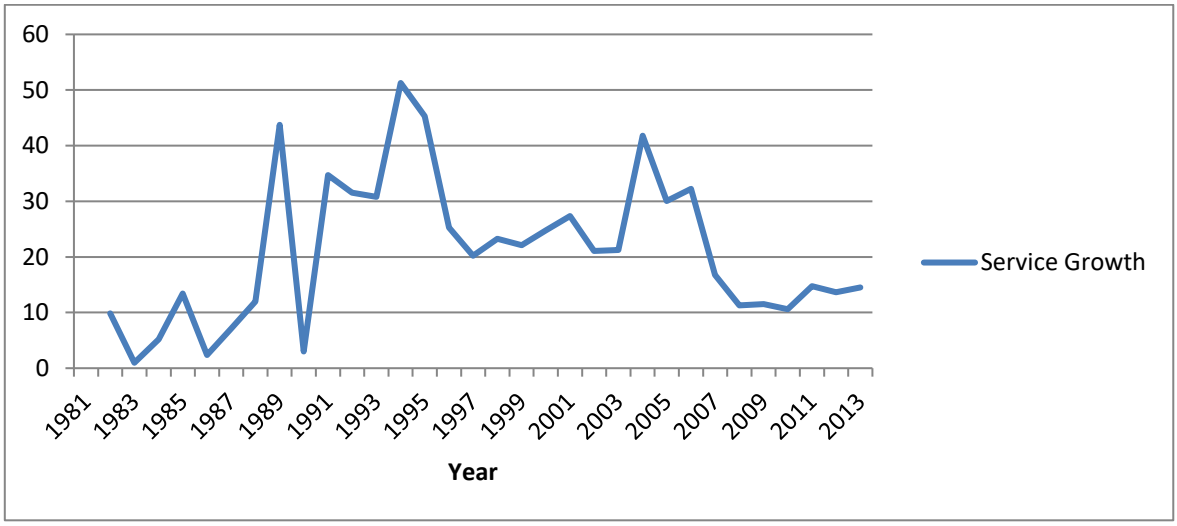


Figure 2.18: Services Sector Growth (%)

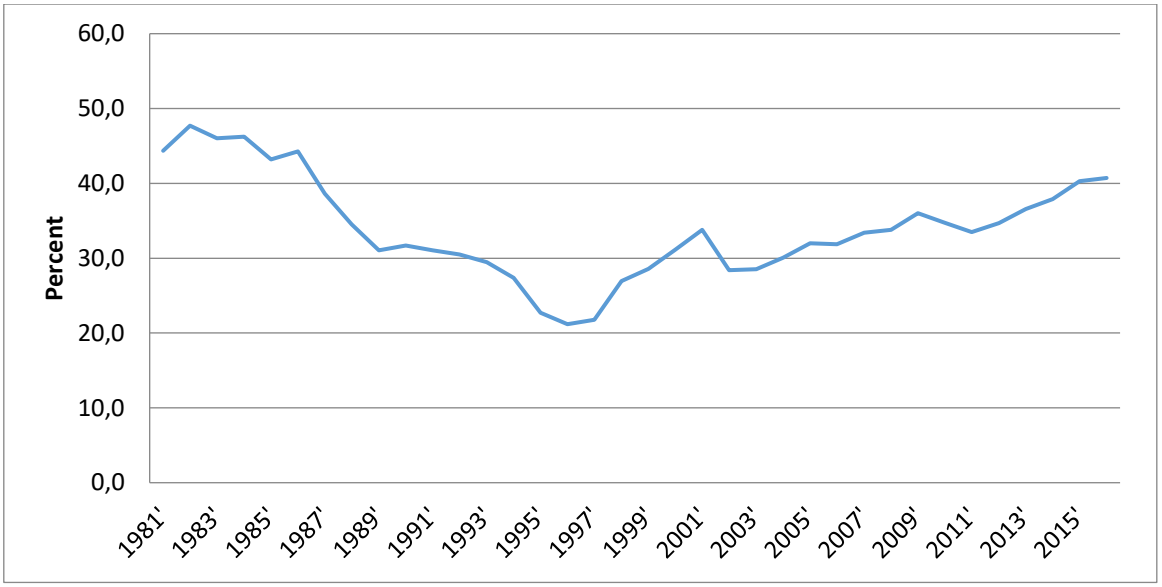


Figure 2.19: Trade Sector Contribution to GDP (%)

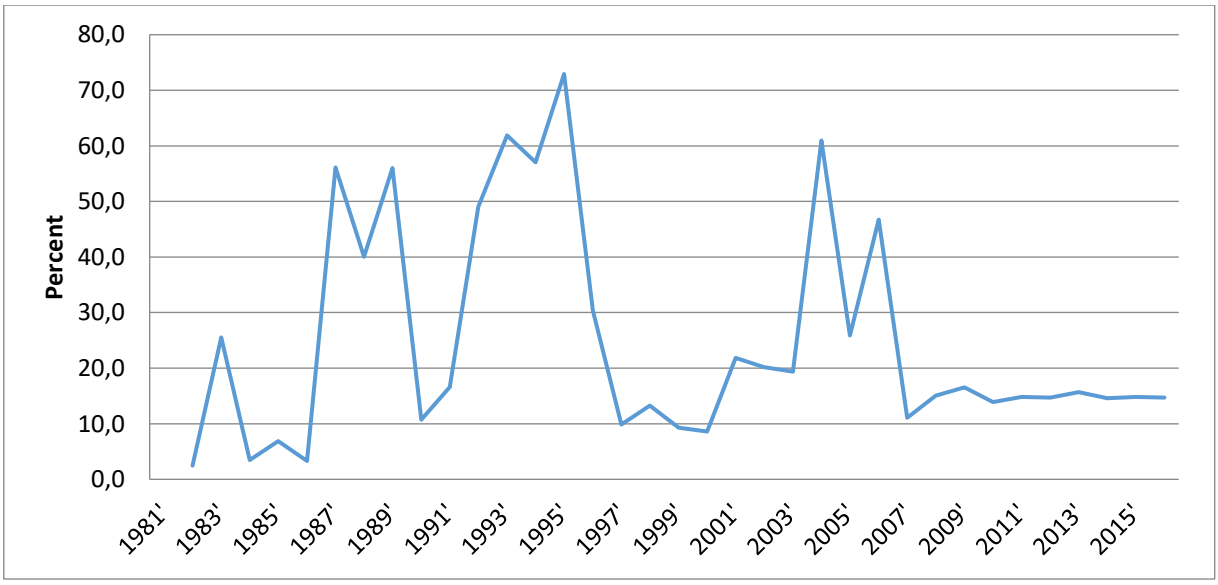


Figure 2.20: Trade Sector GDP Growth Rate (%)

Tourism is not left out in the deficient performance syndrome that has continued to characterise the real sector of the economy. Although it has strong potentials for enhancing employment and revenue for the country, such potentials have remained largely underdeveloped. Employment and revenue from tourism have remained low and insignificant while foreign exchange earnings have been virtually non-existent. The factors responsible for this performance include poor and inadequate infrastructure, political instability, social insecurity, and failure of government to create an enabling environment for private sector participation in the industry.

The Nigerian health sector is characterised by the brain drain, because experienced Nigerian health experts are migrating to other countries in search of better conditions of service. This has led to a deterioration of the country's healthcare system, evidence by high infant and maternal mortality rates as well as the prevalence of diseases in epidemic proportions. Massive immunisation against all vaccine preventable diseases have been embarked on by the government to address the issues. Other steps taken by the government include ensuring universal access to primary healthcare, eradication and prevention of epidemic diseases, resuscitating the secondary healthcare system, and stepping up the enlightenment campaign on the HIV/AIDS pandemic. To stem the migration of health workers, the salaries of the health experts have been reviewed upward and conditions of service have also improved to make working in Nigeria attractive.

2.5. STRUCTURE AND BEHAVIOUR OF LABOUR SUPPLY IN NIGERIA

The structure of labour supply reflects colonial and cultural antecedents as well as social norms prevailing in the country. Considering the profile of the labour force, the population distribution showed that most of the population were within the age bracket 15 to 65 years in 2013. This represents about 52.9 per cent, while only 2.5 per cent are above 65 years. The labour participation rate is low. Just about 38 per cent were female and 52 per cent were male in 2013. Of the employment population, agriculture accounts for 60 per cent and it is usually in smallholding farming. The industry accounts for less than six per cent, service for 17 per cent and agriculture for 41 per cent of the total working population distribution in Nigeria.

Also, the informal sector is the largest employer of labour. Most people within the working age bracket are either engaged as proprietors, paid employees, unpaid family workers or apprentices. Official estimates of those seeking but unable to find jobs are about 7.5 per cent of the labour force. The prevalence of the informal sector is common to the rural and urban settings. The dominance of the informal sector in the urban centre is quite strong while informal agriculture predominates in the rural areas. Therefore, close to 90 per cent of the agricultural activities are carried out at subsistent levels in the rural areas. The largest share of employment in the formal sector is provided by the government. This has led to the ballooning of the public-sector payroll (Agbodike, Justine & Chenna, 2015).

2.5.1. Labour Supply and Unemployment in the Real Sector in Nigeria

The level of unemployment in Nigeria is very high, while data on sectoral unemployment is hard to find. Since unemployment and employment are mirror images, whether the unemployment rate is increasing or decreasing in one sector can be viewed by looking at the employment rate in the various

sectors. Nigeria's economy can broadly be classified into three major sectors, namely primary (agriculture and natural resources); secondary (mainly industry) and tertiary (services as well as wholesale and retail trade) (CBN, 2003). Agriculture is predominant in the primary sector of the Nigerian economy. Therefore, this section gives the trend analysis of employment rates in the primary and secondary sectors using agriculture and industry, respectively.

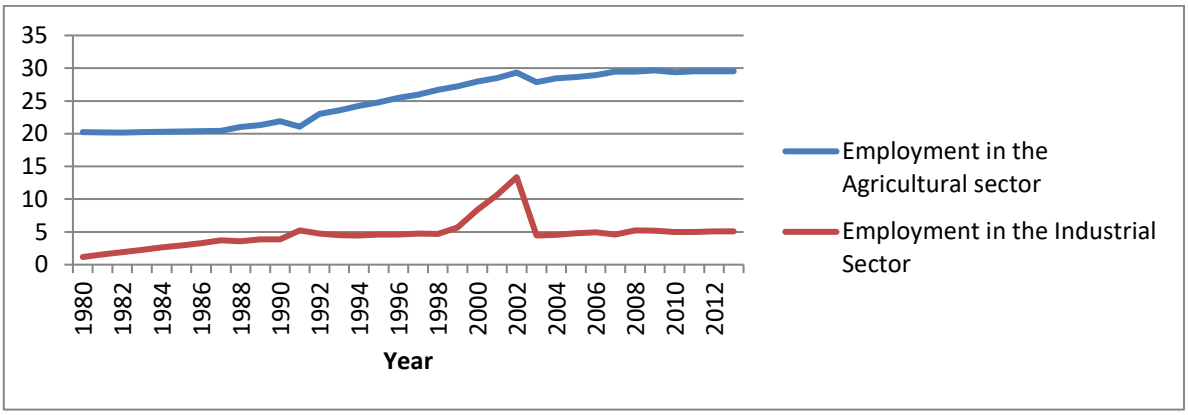


Figure 2.21: Employment in the Agricultural and Manufacturing Sectors in Nigeria
Source: National Bureau of Statistics, 2013.

Over the years, the employment rate in agriculture has trended upwards and it has remained the largest employer of labour in the country (Figure 2.12). The reason is that the system of agriculture practised in Nigeria is still rudimentary and largely labour intensive. Between 1980 and 1987, the rate of employment in agriculture was approximately 20 per cent. Apart from the marginal fall in 1991 and 2005, there has been a steady increase in the rate on an average of one per cent every year.

For industry, the employment rate has been extremely low over the years apart from the major increase of 10.67 per cent and 13.36 per cent in 2001 and 2002 respectively. The employment rate in the industrial sector is approximately four per cent on average. This is very low compared with other sectors. Manufacturing activities have been on the decline owing to the non-competitiveness of the sector. Poor infrastructure and inconsistencies in government policies have seen several manufacturing concerns close and discontinue their operations.

2.5.2. Labour Supply and Employment in the Services Sector in Nigeria

In recent times, the Nigerian economy has been service-led due to structural transformation taking place in the economy (Alemu, 2015). From Figure 2.13 it is evident that the employment rate in the service sector was very low between 1980 and 2002 as its value was below one per cent. The major increase started in 2003 when the employment rate in the sector jumped from a low value of 2.1 per cent in 2002 to a high value of 14.5 per cent in 2003. Ever since, there has been a steady increase in

the employment rate in the sector. The growth of the service sector can be traced to economic development of Nigeria and the sociocultural changes that have accompanied those environmental forces separately or in combination that created new types of services. It has also been revealed that satisfaction of customers' demands, extension of product range, dealing with new competitors at home, improvement of product quality, compliance with Nigerian laws and standards as well as dealing with the challenges of new technology underlined very important motivating factors (Adewole, Adepoju & Adewole, 2012).

Employment in the services sector increased owing to the sharp rise in the contribution of the sector to the GDP during the period. The services sector accounted for the largest share of real GDP in the economy accounting for 52.99 per cent. (NBS). Economic activities in trade, telecommunications and real estate were boosted by the policies of government to liberalise the sectors thus attracting huge investment.

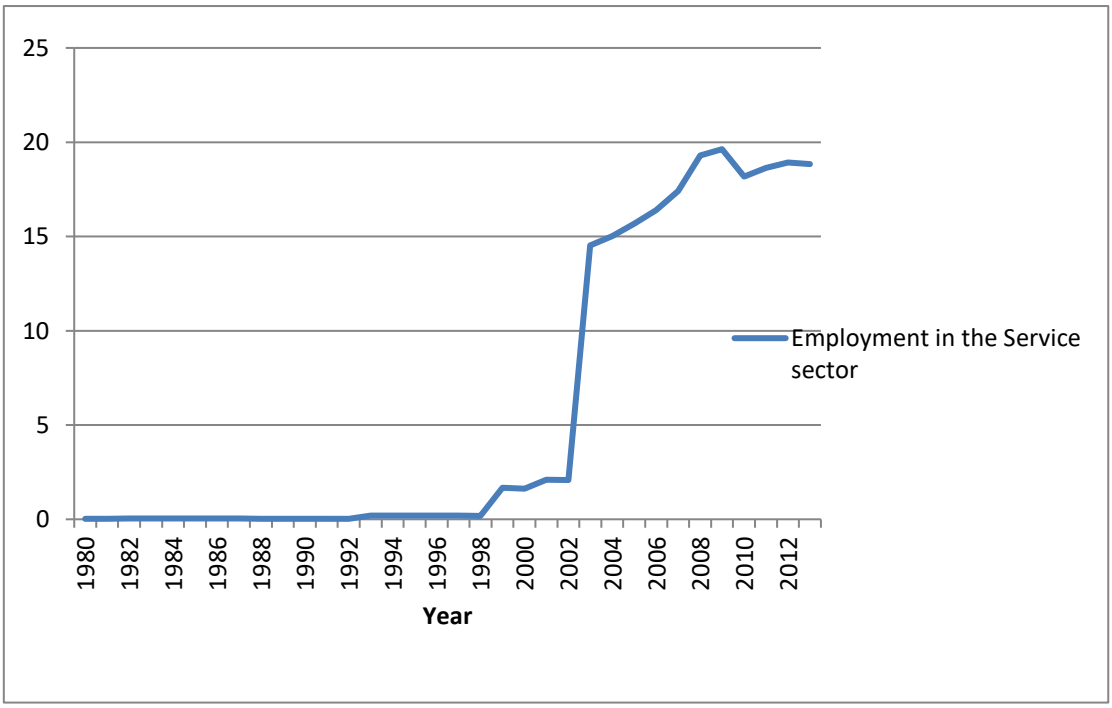


Figure 2.22: Employment in the Services Sector
Source: National Bureau of Statistics, 2013.

2.6. CONCLUSION

This chapter has dealt with the determinants of remittance in a low-income country, Nigeria. Remittance is an important segment of financial flow in Nigeria as it is second to oil as a source of foreign exchange, outpacing other sources. Nonetheless, remittances are not positioned well enough to help contribute meaningfully to economic growth. An increase in the number of emigrants from

Nigeria has contributed to the level of remittance in the country. Moreover, factors that enhance the transfer mechanism such as cost, speed, cultural familiarity and service reliability have contributed immensely to the increase. The global financial crisis adversely affected remittances at the micro level as many migrants now find it difficult to remit money home.

In addition, the chapter has examined the sectoral performance and unemployment in the Nigerian economy. The Nigerian macroeconomic structure is complex and comprises inter-related sectors and activities. The performance of the various sectors has not been impressive, despite its high potential for achieving a far-reaching and diversified economy. The levels of unemployment are also very high, although the employment levels in various sectors have increased over the years. This means that the growth rate in employment has not caught up with the number of people that have joined the Nigerian labour force.

CHAPTER 3
LITERATURE REVIEW

3.1. INTRODUCTION

This chapter provides a review of literature on the Dutch disease effects of remittances. After this introductory section, a review of Dutch disease theories such as the core model and extended exogenous growth model is provided. The review includes theories of exchange rate, such as the purchasing power parity theory, the interest rate parity theory, Balassa-Samuelson theory, the monetary approach (theory), and the Mundell-Fleming approach (theory). Empirical evidence of linkages of remittances and Dutch disease are reviewed under different headings. The linkages include capital inflows and exchange rates, exchange rates and tradable as well as non-tradable sectors, exchange rates and agricultural as well as manufacturing sectors, remittances and Dutch disease, empirical evidence, remittances and exchange rate, overvalued exchange rate and implications for tradable and non-tradable sectors of the economy, Dutch disease and the competitiveness of agricultural and manufacturing sectors, as well as Dutch disease and labour supply/unemployment to agricultural and manufacturing sectors.

3.2. REVIEW OF THEORETICAL LITERATURE

3.2.1. The Dutch Disease Model

This thesis is concerned with examining the Dutch disease effects of remittances on the Nigerian economy. The concept of the Dutch disease was first introduced in the 1970s to explain the negative effects of the surge in revenue from oil and gas exports on the manufacturing sector in the Netherlands. The central tenet of Dutch disease was that oil and gas exports resulted in massive inflows of foreign exchange to the Dutch economy. Such large foreign exchange inflows resulted in an appreciation of the Dutch currency, and this led to an increase in prices of domestically produced goods. The increase in domestic prices made Dutch exports expensive, thereby making them uncompetitive in international markets. This had adverse effects on the manufacturing sector, manifested in shrinking manufacturing output. These signs, symptoms and consequences of such massive foreign exchange inflows were termed Dutch disease. Dutch disease was subsequently identified as being manifested in many oil exporting countries. The phenomenon was later generalised to natural resource exporting countries.

Recently, the concept of Dutch disease has been used to describe situations in countries that are not necessarily commodity exporters, but experience massive foreign exchange inflows. The mechanisms

by which these foreign exchange inflows work are similar in these types of country, where the foreign exchange inflows make some other sectors of the economy uncompetitive. Consistent with this thinking, the concept of Dutch disease has been applied to the effects of remittance inflows on developing and emerging economies.

The theoretical underpinnings of Dutch disease were set out in the model of Corden and Neary (1982). They (Corden & Neary, 1982) developed the Dutch disease model under a set of assumptions that include full and efficient employment of factors of production, factors of production which are mobile and transferable between sectors, and perfectly elastic demand for tradable goods. Three types of effect related to the appreciation of the real exchange rate are identified: the spending effect, the resource transfer effect, and the expenditure-switching effect.

The model assumes an economy where labour endowments are used to produce two types of commodities: tradables and non-tradables. Massive foreign exchange inflows, because of either resource exports or remittances, lead to an increase in aggregate expenditure on tradable as well as non-tradable goods, thereby influencing the real exchange rate. The workings of the model can be illustrated in Figure 3.1. In the figure, the production possibility frontier (PPF) and indifference curves (ID) are shown in the lower right quadrant, while the market for tradables is depicted in the upper left quadrant, with the market for non-tradables shown in the upper right quadrant. The economy produces and consumes at point B on the PPF and on the ID.

Keeping with the small-country hypothesis, demand in the tradables sector (DT) is perfectly elastic. Point C, where the consumption and production of tradables are equal, gives the point where the initial trade balance is zero. Point M gives the initial equilibrium in the market for non-tradables. The surge in financial inflows increases demand for non-tradables, and this results in an upward shift in the demand for non-tradables (DNT) and an increase in price of non-tradables. This is reflected in a movement from point M to M' in the upper-right quadrant. As the price of tradables is fixed at PT, there is an appreciation of the real exchange rate, and this discourages the production of tradables. This is the spending effect.

Following the foreign exchange inflows, there is a reallocation of resources from the tradables to the non-tradables sector. This is illustrated in the lower right quadrant with the movement from point B to B’ on the PPF. This transfer is also shown in the upper left quadrant by a shift of the supply schedule for tradables from ST to ST’, and in the upper right quadrant by a shift of the supply of non-tradables from SNT to SNT’. This is the resource transfer effect.

The financial inflows lead to an increase in real income illustrated by a shift from Y to Y'. This, coupled with the increase in the relative price of non-tradables, results in an increase in the demand for tradables shown by a shift from OTQT to OTQDT. This shows a higher level of consumption, B'', on the indifference curve ID'. Since the production of tradables has fallen, and as there is an increase in consumption at the given world price, there is a worsening of the trade balance, which moves from zero to a deficit of C'C" in the upper-left quadrant. The increased spending on tradables that goes to imports allows the financial inflows to be absorbed through a wider trade deficit. This is the expenditure-switching effect and refers to the disincentive to buy non-tradables, induced by the appreciation of the real exchange rate.

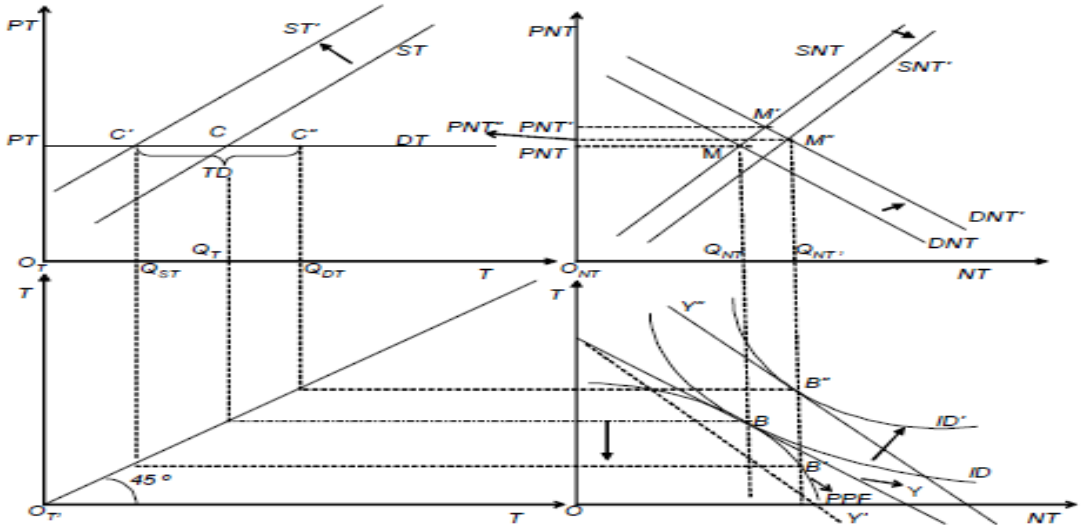


Figure 3.1: Diagrammatic Approach of the Dutch Disease Model
Source: Nkusu, 2004.

3.2.2. Criticisms of the Dutch Disease Model: Applicability to Low-Income Countries

The Dutch disease model has been criticised that its core assumptions are not in line with some key characteristics of low-income countries. Firstly, the assumption of full and efficient employment of factors of production as implied by a country producing on its PPF is not applicable to many countries experiencing high unemployment and inefficient use of factors of production.

Also, the small-country assumption is not realistic in many low-income countries, especially with respect to many domestically produced importables. This assumption implies that a booming non-tradables sector would instigate upward pressures on wages and this would discourage production of tradables. The tradables sector can be seen as comprising exportables and importables. The prediction of the Dutch disease model is that import-competing manufactured goods and raw materials (which

are a subset of importables) impede industrialisation. However, since many low-income countries are characterised by imperfect substitution between local and foreign manufactured goods, such threats of impeding industrialisation are exaggerated. As a consequence of this imperfect substitutability, opportunities arise for local manufacturers to respond to domestic market conditions by raising supply and prices, irrespective of whether they use imported or domestically produced inputs.

Furthermore, appreciation of the currency can benefit manufacturing firms that have a considerable proportion of inputs which are imported. This is because part of their production costs expressed in domestic currency would be subdued. If imported and domestically produced inputs are complements, then the demand for domestic inputs can also increase, encouraging suppliers of these inputs to produce more. Firms that rely primarily on domestic inputs can demand more inputs and increase their supply of goods in response to higher prices and still expand, depending on price elasticities of the supply of inputs and the demand for goods.

3.2.3. The Dutch Disease Model Modified

These criticisms of the Dutch disease model have led to its modification to fit more realistically the features of low-income countries. These modifications are essentially in the form of relaxing the assumptions, thereby making it possible to avoid its predictions.

Figure 3.2 presents the illustration of the modified Dutch disease model. The economy initially produces within its PPF at point A, while consuming at point B on the indifference curve ID. Following the relaxation of the small-country assumption, the demand for tradables (DT), is downward sloping. The total supply of tradables (ST) is a combination of two things: home supply (HST) and imports which are the same as the trade deficit (TD). The tradables sector initial equilibrium is at point C while the non-tradables sector initial equilibrium is at point M. The financial inflows result in increased spending, which leads to an upward shift of the demand for non-tradables (DNT) and a rise in price of non-tradables from PNT to PNT'. The higher income from financial inflows moves consumption in the economy to a higher indifference curve B' and production expands to point A' on the PPF. This instigates movement of supply for tradables to H_{ST}' and supply for non-tradables to SNT'. The new trade deficit is given by TD', which is provided by the difference between production and consumption of tradables (A'–B'). The new equilibrium in the non-tradables market is given by M", which is consistent with an appreciation of the real exchange rate.

This modified framework shows that it is possible to have large foreign exchange inflows that will instigate real exchange rate appreciation, increased production of both tradables and non-tradables, and a narrowing of the trade balance. This modification suggests that the resource transfer effect

depicted in the original model of Dutch disease is a consequence of the spending effect that occurs only under the assumption of full employment. Upon relaxation of the assumption of full employment, the spending effect is not a sufficient condition for Dutch disease-type effects to occur. In addition, the relaxation of the small-country assumption changes the results of the Dutch disease model. After both the full employment and the small-country hypotheses have been relaxed, the real exchange rate may not appreciate at all because of a spending boom induced by foreign exchange inflows, or, if it does, the appreciation will not necessarily give rise to a contraction of the tradables sector. An increased use of available resources allows both the tradable and non-tradable sectors to expand, and the trade balance would not necessarily deteriorate.

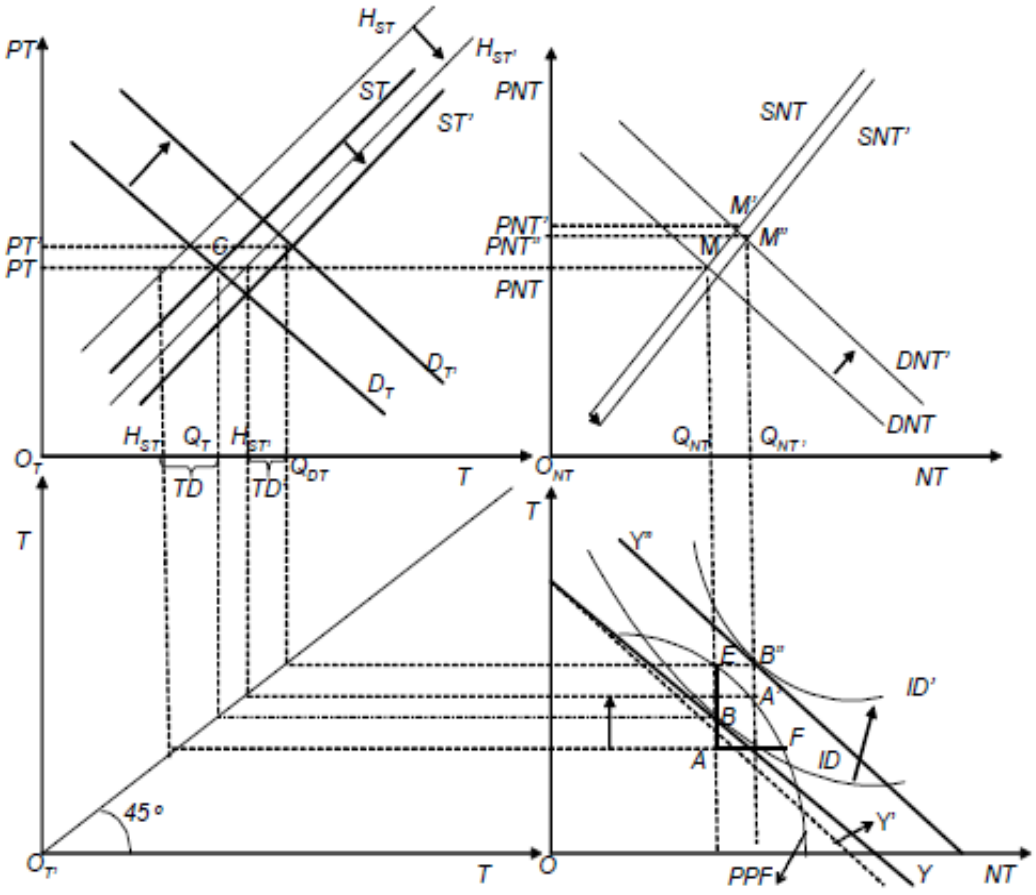


Figure 3.2: The Dutch Disease Model Modified
Source: Nkusu, 2004.

3.3. THE IMPACTS OF EXCHANGE RATES

3.3.1. Exchange Rates and Capital Inflows

Biswas, Mandal and Saha (2014) used the combination of Heckscher-Ohlin and Ricardo Viner-Jones to describe the relationship that exists between exchange rate and capital flows. The model is based on a perfectly competitive small open economy with three sectors. The three are non-tradable goods sector producing Z, an importable goods sector producing Y and an exportable sector producing X. It also has constant returns to scale. The model further assumes that goods Y and Z are produced with labour (Ly and Lz, respectively), and domestic capital, (Ky and Kz, respectively). Good X is produced using labour Lx and the different kinds of capital. It is also assumed that there is huge deficiency in capital, which results in high interest rates in domestic markets.

$$K^* = f(r^* - r^*) \tag{3.1}$$

Where $f(r^* - \bar{r}^*) > 0$,

The full employment conditions for the factors of production

$$a_{LY}Y + a_{LZ}Z = L - a_{LX}X \tag{3.2}$$

$$a_{KY}Y + a_{LZ}Z = \bar{K} \tag{3.3}$$

$$a_{XX}X = K^* - K^*d \tag{3.4}$$

The ‘a’ denotes the technology of production, L and K are the total labour and domestic capital endowment in the economy. K^*d is the amount of domestic capital that is particularly used in exportable sector K^* is the foreign capital employed in the exportable sector. The zero profit conditions are:

$$a_{LY}W + a_{XX}r^* = P^*X \tag{3.5}$$

$$a_{LY}W + a_{KY}r = P^*Y = 1 \tag{3.6}$$

$$a_{LZ}W + a_{KZ}r - P_Z \tag{3.7}$$

w, r and r^* are wage rate of labour, rental of K and rental of K^* respectively. The world price of Y is normalised to one so that P^*X and P_Z are the relative prices of the exportable and nontraded goods respectively. The real exchange can be described as the relative price of tradeable goods to non-tradable goods.

$$\varepsilon = \frac{Py}{Pz} \tag{3.8}$$

If all the goods and services are traded, we have ample scope for designing and defining real exchange rates (RER). But the scope becomes really constricted if the economy produces nontraded goods along with other traded goods. Nontraded goods cannot be left aside as this induces changes in traded goods' production and factor prices of the economy. So, the RER should take into account traded and nontraded goods and to the best of the researcher's knowledge the above is the only definition that takes care of both goods (Biswas et al., 2014).

Inflow of foreign capital depresses r^*. w has to rise as P^*X is constant, therefore, r must fall in equation 3.6, thus, we get the values of w and r that directs us to solve the value of P_Z. Hence, given factor endowments $\overline{L}$, $\overline{K}$, K^*d, K^* in equations 3.2 to 3.4 determine X, Y and Z. However, note that change in factor prices may indicate some factor substitution in the model (Biswas et al., 2014).

3.3.2. Exchange Rates and Tradeable and Non-Tradable Sectors

According to Ruscher and Wolff (2009), providing the theoretical linkage of exchange rate and tradable and non-tradable sectors can be anchored on the model of Obstfeld and Rogoff (2000). The model establishes the relevance of the exchange rate for current accounts. The assumption of the model includes fixed endowments in a tradable and non-tradable sector and consumers who derive utility from the consumption of tradables CT and CNT based on equation 3.9.

$$U = \left\{\gamma^{1/\theta} C_T^{\theta-1} + (1-\gamma)^{1/\theta} C_{NT}^{\theta-1/\theta}\right\}^{\frac{\theta}{\theta-1}} \tag{3.9}$$

Equation 3.9 is used for consumer optimisation and the relative prices of NT and T are presented in equation 3.10.

$$P = \frac{P_{NT}}{P_T} = \left\{\frac{1-\gamma}{\gamma}\right\}^{1/\theta} \left\{\frac{C_T}{Y_{NT}}\right\}^{1/\theta} \tag{3.10}$$

The consumer price index that is presented in terms of tradable goods is contained in equation 3.11.

$$P = (\gamma + (1-\gamma)p^{1-\theta})^{\frac{1}{1-\theta}} \tag{3.11}$$

This implies that change in the relative price of non-tradable to tradable goods can be imputed with equation 3.11. The equation entails a reduction in consumption of tradable goods. Obstfeld and Rogoff (2000) assumed that the current account is equal to the trade balance, which is given by the difference between the endowment and consumption of tradable goods. They added that the

consumption of tradable goods will have to be accompanied by a substantial decrease in the price of non-tradable goods. In sum, the model predicts that changes in the trade balance are connected with the relative price of tradable and non-tradable goods and services.

Obstfeld and Rogoff (2004) extended the model, which made the model a symmetry of two countries, in which the foreign product is not a perfect substitute for domestically produced tradable goods. Under plausible values for substitution elasticities, in particular when the elasticity of substitution between foreign and home produced tradables is larger than between tradable and non-tradable goods, they show that the central factor for changing current accounts is not the relative price of home-produced tradables relative to foreign-produced tradables but the internal relative prices of tradables and non-tradables (Ruscher & Wolff, 2009)

3.3.3. Exchange Rate and Agricultural and Manufacturing Sectors

The pioneer work regarding the theoretical linkage between exchange rate and agricultural trade was done by Schuh (1974). The author opined that the overvalued dollar caused the decline in agricultural exports based on their relative expense in other nations. He further claimed that the overvalued dollar resulted in depressing prices and caused farm profits to be lowered, while causing undervaluation of farm resources and oversupply of output (Kristinek & Anderson, 2002).

Schuh (1984) further elaborated on the relationship between agriculture and the exchange rate and stated that the changes in imports and exports could be blamed on the changes in the value of the dollar, especially in the case of a flexible exchange rate. He maintained that monetary policy induced international capital flows. This could cause changes in the value of the dollar. Henisz (2000) claimed that Schuh's theory overstates the macroeconomic position. He claimed that the process of revising price support policy to accommodate a strong dollar happened when the dollar depreciated. This, he argued, restored US exports, decreased excess stocks and contributed to allowing the easing of acreage supply control that was favourable to agriculture.

3.4. EMPIRICAL REVIEW

3.4.1. Remittances and Exchange Rate

Fuentes and Herrera (2007) studied emigrant remittances and the real exchange rate in Guatemala. They found that real exchange rate appreciation was influenced primarily by demand factors and that the observed appreciation is not as sturdy as suggested by the IMF's real effective exchange rate. Lopez, Molina and Bussolo (2007) explored the empirical evidence regarding the impact of remittances on the real exchange rate. They found that remittances do appear to lead to a significant

real exchange rate appreciation. Ball, Cruz-Zuniga, Lopez and Reyes (2008) predicted that remittances should be inflationary and generate an increase in the domestic money supply under a fixed regime but deflationary and generate no change in the money supply under a flexible regime. These differences manifest in the data. This adds to the understanding of the true effect of remittances on economies and suggests that results in the literature without control for regimes may be biased. They found the predictions for inflation and the money supply supported by the data, but less supportive of the real exchange rate predictions. They also investigated the potential for reverse causality between the real exchange rate and remittances and found a variable ordering regarding inflation and the nominal money supply.

Singer (2010) examined the relationship between migrant remittances and developing nations' exchange rate. This author argued that remittances mitigate the costs of forgone domestic monetary policy autonomy and therefore increase the probability of choosing to fix the exchange rate. Barajas, Chami, Hakura and Montiel (2010) investigated the impact of workers' remittances on equilibrium real exchange rates (ERER) in recipient economies. Using a small open economy model, it shows that standard "Dutch disease" results of appreciation are substantially weakened or even overturned depending on: degree of openness, factor mobility between domestic sectors, and counter cyclicality of remittances; the share of consumption in tradables; and the sensitivity of a country's risk premium to remittance flows. Panel cointegration techniques on a large set of countries provide support for these analytical results and show that ERER appreciation in response to sustained remittance flows tends to be quantitatively small.

Olubiyi and Kehinde (2015) studied the effect of exchange rate on remittances in Nigeria. It was discovered that real exchange rate impacted negatively on remittances. This implies that an expected depreciation of the real exchange rate which signals adverse economic conditions back home dwarfs remittance inflows. Although altruism mostly dictates remittances to Nigeria, self-interest or returns-seeking motives are also important.

Using country-level data, Ajilore and Ikhide (2013) examined the short and long-run impact of remittances on financial development. Five sub-Saharan African countries were selected: Cape Verde, Lesotho, Nigeria, Senegal and Togo. They tested for the existence of cointegration relationship employing the auto-regressive distributed lag (ARDL) bounds testing approach. The study established the existence of long-run level relationships between remittances and financial development in all the countries tested except Nigeria. In a similar study, Ajilore and Ikhide (2013) investigated the relationship between migrants' remittances and economic growth in the same SSA countries selected on the basis of significant remittance inflows as a proportion of GDP. The long-

run ARDL estimates indicate positive and significant effects of migrants' remittances on growth performance in Cape Verde and Nigeria, but negative, and slightly significant effects for Lesotho, with no evidence of long-run level relationships between remittances and economic growth in Senegal and Togo. The study challenges the assumption that size may matter in understanding the remittance–growth nexus. Both studies advocate country-level policies aimed at enhancing the efficiency of remittance inflows and promote the use of remittances for developmental purposes.

3.4.2. Overvalued Exchange Rate and Implications for Tradable and Non-Tradable Sectors of the Economy

Cheung and Kakkar (2002) studied the bilateral real exchange rates of five East Asian economies vis-à-vis the US dollar and tested whether permanent changes in these real exchange rates can be explained by permanent changes in the relative prices of non-traded and traded goods. They found that, apart from the South Korean-US real exchange rate, the other four real exchange rates are cointegrated with non-traded and traded goods' relative prices. Difuntorum (2008) studied exchange rate overvaluation and its impact on manufactured export performance in the Philippines. They found that continuous overvaluation of the RER during the period indicates that the country has not been adopting a competitive exchange rate which could have promoted its exports. This signifies that the country has been losing its competitive position relative to its trading partners and competitors over an extended period. The results of the RER calculation indicate that the country's RER was overvalued from 1981 to 2005 in relation to the country's trading partners and competitors. Between the two, the country has posted more significant overvaluation in relation to its competitors than to its trading partners. The significant loss of competitiveness of the country relative to its Asian competitors may partly explain the comparatively poor manufactured export performance of the country relative to these countries over the years. Also, the overvalued exchange rate discriminates against some of the country's major manufactured exports; it encouraged the promotion of imports in the country and discouraged the promotion of the country's domestic and/or import substituting industries.

Bresser-Pereira (2009) affirmed that in developing countries there is the tendency of exchange rate overvaluation. It has two structural causes: the Dutch disease and the attraction that higher profit and interest rates usually prevailing in developing countries exert on foreign capital and four policy causes: the policy of growth with foreign savings, the control of inflation to exchange rate anchors, the policy of "capital deepening" and exchange rate populism. The country either neutralises this tendency and grows fast or suffers cyclical balance of payment crises. Sarno and Passaria (2011) empirically examined the properties of deviations to international tradable goods or sectors from the

law of one price. They concluded that a careful reading of the literature suggests that this notion of PPP holds in the long run for a broad range of tradable goods and services and for a broad set of currencies. In turn, one implication is that the exchange rate risk for a long-horizon investor is relatively small.

3.4.3. Dutch Disease and the Competitiveness of Agricultural and Manufacturing Sectors

Ahrend, De Rosa and Tompson (2007) examined the development of the Russian industry in comparison with the Ukrainian industry between 1995 and 2004 in an effort to ascertain the extent, if any, to which Russian manufacturing showed signs of succumbing to 'Dutch disease'. Ukraine and Russia began the market transition with broadly similar institutions, industrial structures and levels of technology, and the economic reforms implemented in the two countries were also similar, although Ukraine was reckoned to lag behind Russia in many areas. The main contrast between them is Russia's greater resource wealth; that is, differences in industrial development since 1991 may to some degree be attributable to differences in initial natural resource endowments. Therefore, Ukraine could provide a rough approximation of how a resource-poor Russia might have developed during the transition period.

Ueno (2010) assessed the Dutch disease models vis-à-vis the Brazilian economy and the recent pre-salt discoveries of oil. He provided a detailed analysis of macroeconomic indicators, concluding that the country avoided the classic Dutch disease but has been losing competitiveness due to overvaluation of the currency. Shakeri, Gray and Leonard (2012) investigated whether Dutch disease was a failure to compete using a diagnosis of Canada's manufacturing woes. The empirical evidence indicated that Canada suffers from a mild case of the Dutch disease, which has caused small, surmountable problems for most manufacturing industries and larger challenges for the public finances of resource-rich provinces. The problem in manufacturing is not a rise in the exchange rate per se, but sluggish productivity growth and, in more recent years, a cyclical downturn in domestic and global demand, which needs to be addressed independently of future exchange rate trends.

Apergisa, El-Montasser, Sekyere, Ajmi and Gupta (2014) investigated the effect of oil rents on agriculture value added in oil producing Middle Eastern and North African (MENA) countries. They found a negative relationship between oil rents and agriculture value added in the long run, with a rather slow rate of short-run adjustment of agriculture value added back to equilibrium after a boom in oil rents. These results indicate that an oil sector boom is associated with a contraction in the agriculture sectors of the countries in the panel in the long run. Accordingly, this is probably attributable to a resource movement effect from other economic sectors to the booming oil sector in

these countries. This serves as evidence of a Dutch disease effect of an oil sector boom on agriculture in the MENA countries in this study.

3.4.4. Dutch Disease and Labour Supply/Unemployment to Agricultural and Manufacturing Sector

Van (2009) examined the effects of Dutch disease on the labour market, focusing on women, services and industrialisation. He found that in a low-industrialisation economy, land incomes are high, which means high demand for household services and women's wages that discourage investment in manufacturing. This negative effect of a large service industry on manufacturing is a form of Dutch disease. Multiple equilibria are possible when industrialisation's negative effect on land incomes is sufficiently large, which is more likely in economies with high land-to-labour ratios. When technology growth depends on the size of manufacturing, employment of women in manufacturing must reach a critical size to sustain growth. Thus, countries can be trapped in a state where women work in services and manufacturing growth is low.

Frederiksen (2006) studied a model of Dutch disease with learning by doing and household production. The study compared economies with mobile labour and gender-specific sectors. The analysis suggested that labour mobility and differences in how gender is grouped across sectors play a role in how natural resource abundance impacts on economic performance. In addition, when sectors are gender segregated, whether women work in the traded or non-traded sector determines how the economy responds to increased resource abundance. Also, the resource impact on the real exchange and the wage rates depends on the gender-grouping of the labour market. The wage rates generally differ between sectors when labour is immobile. Moreover, when men work in the traded sector, only female wages are boosted by increased resource abundance, whereas when men work in the non-traded sector, female and male wages increase. The results of the study demonstrated that linking labour market patterns to natural resource abundance may also explain certain structures of the society. In particular, when women have employment possibilities in the traded sector, abundant natural resources tie them to the home.

Beine, Coulombe and Vermeulen (2014) evaluated whether immigration can mitigate the Dutch disease effects associated with booms in natural resource sectors. They derived predicted changes in the size of the non-tradable sector from a small general-equilibrium model according to Obstfeld-Rogoff. They found evidence that aggregate immigration mitigates the increase in size of the non-tradable sector in booming regions. The mitigation effect is due mostly to interprovincial migration and temporary foreign workers. There is no evidence of such an effect for permanent international

immigration. Interprovincial migration also results in a spreading effect of Dutch disease from booming to non-booming provinces.

3.4.5. Capital Inflow and Exchange Rate

Several authors have analysed the link between capital flows and exchange rate. They include Gregorios (2003), who investigated the relationship between capital flows and nominal exchange rates for five major countries. He was motivated by the international finance theory which suggests that currencies are as much influenced by capital flows as by current account balances and long-term interest rates. The study confirmed that incorporating net cross-border equity flows into standard linear empirical exchange rate models can improve the in-sample performance, whereas net cross-border bond flows are immaterial for exchange rate movements. Positive innovations to home equity returns (relative to the foreign markets) are associated with short-run home currency appreciations and equity inflows, whereas positive shocks to home interest rates (relative to the foreign countries) cause currency movements that are consistent with the long-run interpretation of uncovered interest rate parity (UIP). An equity-augmented linear model provides support for exchange rate predictability and outperforms a random walk in several cases.

Athukorala and Rajapatirana (2003) made use of a comparative analysis of the Asian and Latin America markets from 1985 to 2000 to investigate the relationship between real exchange rate and capital inflows. They confirmed that the real exchange rate with respect to capital inflow in Latin American countries appreciate higher than that of Asian countries despite the Asian higher capital flows.

Opoku-Afari, Morrissey and Lloyd (2004) concentrated on the effects of capital inflows (by decomposing capital inflows into official inflows, ‘permanent’ inflows and ‘non-permanent’ inflows). As predicted by the Dutch disease theory, results indicated that capital inflows tend to appreciate the real exchange rate in the long run. Capital inflows represent the only variable generating real appreciation in the long run; technology change, trade (exports) and terms of trade all tend to depreciate the real exchange rate. The only variable that has a significant (depreciating) effect on the real exchange rate in the short run is trade, implying that changes in exports are the major drivers of exchange rate misalignment. It was also shown that the real exchange rate is slow to adjust back to equilibrium, implying policy ineffectiveness or inflexibility.

Lartey (2008) analysed the effects of the level and share of capital inflow on resource reallocation and real exchange rate movements in a small open economy. He found that there exists a trade-off between resource reallocation and the degree of real exchange rate appreciation. In particular, the less

the labour the tradable sector loses to the non-tradable sector, the greater the real exchange rate appreciation. This result is driven by the share of investment accounted for by foreign capital, and suggests that an emerging market economy that adopts a production technique which utilises a greater share of foreign capital relative to domestic capital will be more susceptible to Dutch disease following an increase in capital inflow. Similarly, Rashid (2009) investigated the effects of capital inflows on nominal and real effective exchange rate volatilities. The key message of the analysis is that there is a significant causal relationship between foreign capital inflows and exchange rate volatility. He found that there is a need to manage capital inflows in such a way that they should not fuel exchange rate volatility.

Jongwanich (2010) examined the nexus between capital flows and real exchange rate (RER) in emerging Asian countries using a dynamic panel-data model for 2000 to 2009. The results showed that compositions of capital flows matter in determining the impacts of the flows on the RER. Portfolio investment and other investments (including bank loans) bring in a faster RER appreciation than FDI. However, the magnitudes of appreciation among capital flows are close to each other. The increasing importance of merger and acquisition activities in FDI makes the flows move close to other forms of capital flows, especially portfolio investment. He also found that capital outflows bring about a greater degree of exchange rate adjustment than capital inflows.

Combes, Kinda and Plane (2011) analysed the impact of capital inflows and the exchange rate regime on the real effective exchange rate. A wide range of developing countries (42 countries) was considered with estimation based on panel cointegration techniques. The results show that public and private inflows cause the real effective exchange rate to appreciate. Among private inflows, portfolio investment has the biggest effect on appreciation, almost seven times that of foreign direct investment or bank loans, and private inflows have the smallest effect. Using a de facto measure of exchange rate flexibility, they found that a more flexible exchange rate helps to dampen appreciation of the real effective exchange rate caused by capital inflows.

Magud, Reinhart and Vesperoni (2012) analysed the impact of exchange rate flexibility on credit markets during periods of large capital inflows. They showed that bank credit grows more rapidly and its composition tilts to foreign currency in economies with less flexible exchange rate regimes, and these results are not explained entirely by the fact that the latter attract more capital inflows than economies with more flexible regimes. They found that countries with less flexible exchange rate regimes may stand to benefit the most from regulatory policies that reduce banks' incentives to tap external markets and to lend/borrow in foreign currency. These policies include marginal reserve

requirements on foreign lending, currency-dependent liquidity requirements, higher capital requirements and/or dynamic provision of foreign exchange loans.

Asogwa, Monday and Urama (2013) examined the impact of exchange rate fluctuations on capital inflows in Nigeria from 1970 to 2010. Using the generalised autoregressive conditional heteroscedasticity (GARCH) model, results obtained indicated that the impact of exchange rate fluctuations on capital movement into the Nigerian economy at this period was not as intense as that of its trade openness. Farhi and Werning (2014) considered a standard New Keynesian model of a small open economy with nominal rigidities focused on optimal capital controls. Consistent with the Mundellian view, they found that the exchange rate regime is key. However, in contrast with the Mundellian view, they also found that capital controls are desirable even when the exchange rate is flexible. Optimal capital controls lean against the wind and help smooth out capital flows. Obiechina and Ukeje (2013) examined the impact of capital flows (foreign direct investment), exchange rate, export and trade openness on economic growth in Nigeria as well as the causal long-run relationship among the variables, using time series data from 1970 to 2010. It was observed that all the variables, except the FDI, are statistically significant and impact on economic growth in the short-run dynamic equilibrium model. An exogeneity test confirmed that FDI has weak exogeneity with economic growth. In addition, the Pairwise Granger causality revealed the existence of uni-directional causality between economic growth and FDI, as well as uni-directional and bi-directional causality among some of the variables.

Ifeakachukwu and Ditimi (2014) studied the nature of the causal relationship and the impact of capital inflows on the exchange rate in Nigeria between 1986 and 2011. They assumed that capital inflows include foreign direct investment as well as foreign portfolio investment and concluded that the relationship that exists between exchange rate and foreign direct investment is negative but positive with portfolio investment in the long run, while there is no relationship in the short run and no causal relationship. They consequently concluded that the Nigerian capital inflows and exchange rate relation is mostly determined by time and specifically a long-run phenomenon, not short run.

3.4.6. Exchange rate and the Tradable as well as Non-tradable Sectors

Numerous previous studies have analysed the effects of the exchange rate on the tradable and non-tradable sectors. We start from Burstein, Eichenbaum and Rebelo (2005), who examined the importance of non-tradable goods' prices in cyclical real exchange rate fluctuations. They found that more than half of these fluctuations are accounted for by movements in the price of non-tradable goods relative to the price of pure-traded goods. Dotsey and Duarte (2005) examined the non-tradable

goods, market segmentation in conjunction with exchange rates. They explored the role of non-tradable goods (in final consumption and in retail services) for exchange rate variability in the context of an otherwise standard open-economy macro model. The outcome of their studies affirmed that non-tradable goods increase the volatility of exchange rates by about 50 per cent compared to the model without non-tradable consumption goods or retail services and lower the correlation of exchange rates with other macro variables. In addition, the specification disentangles the properties of alternative pricing mechanisms that are standard in the open-economy macro literature.

Benigno and Thoenissen (2006) examined the consumption and real exchange rates with incomplete markets and non-traded goods. They addressed the consumption–real exchange rate anomaly. They show that if a canonical international business cycle model, similar to the one proposed by Chami, Cosimano and Gapen (2006), includes an incomplete financial markets structure as well as a non-traded goods sector, then such a model, calibrated in a standard way, will generate cross-correlations between the real exchange rate and relative consumption close to those in the data. Also, the presence of a non-traded goods sector allows the real exchange rate to appreciate (decrease) in response to a productivity shock to the domestic traded goods sector – the familiar Balassa-Samuelson effect – while limited risk-sharing opportunities cause consumption in the domestic economy to increases by more than consumption in the foreign economy following such a shock. The result is a negative cross-correlation between the real exchange rate and relative consumption.

Çıplak (2007) examined real exchange rate fluctuations and relative prices in Turkey. The relation is found to be stronger with the relative price of tradable goods, unlike the traditional theory. But the proportion of the fluctuations in real exchange rates accounted for by relative non-tradable goods prices has increased in recent years; that is, the driver of real exchange rates in Turkey has been nominal factors, not real factors, until recently. Ruscher and Wolff (2009) argue, ‘External rebalancing is not just an exporters' story: Real exchange rates, the non-tradable sector and the euro’. Having employed different measures of the real effective exchange rate, they found that this long-run link hinges on the relative price of non-tradable to tradable goods and services in relation to their trading partners. In addition, an improvement in the trade balance is associated with a fall in the relative price of non-tradable goods and services. Also, Government consumption increases the relative price of non-tradable goods.

Drozd and Nosal (2010) examined the non-tradable goods and real exchange rate. They found that while the parameterised standard model can generate a volatile and persistent tradable component of the real exchange rate, it implies a volatile non-tradable component. Moreover, when compared to the data, the non-tradable component exhibits a strong negative correlation with the tradable

component, resulting in an insufficient volatility of the overall index. Also, they found that the key factor generating this puzzle is the response of the model to the shock in the tradable sector, which in the data turns out to be the key driver of the overall productivity.

Rabanal and Tuesta (2012) assessed the importance of non-tradable goods and distribution costs to explain real exchange rate dynamics. They found that the estimated model can match characteristics of the data that are relevant in international macroeconomics, such as real exchange rate persistence and volatility, as well as the correlation between the real exchange rate and other variables. Also, non-tradable sector technology shocks explain one third of real exchange rate volatility. More so, they show that, in order to explain the low correlation between the ratio of relative consumption and the real exchange rates across countries, demand shocks are necessary.

Akkoyun, Arslan and Kılınç (2012) assessed the risk sharing and real exchange rates with special reference to the role of non-tradable sector and trend shocks. They developed an international real business cycle model with two countries that contain tradable and non-tradable sectors with cointegrated total factor productivity (TFP) shocks. The addition of non-tradable sector and cointegrated shocks improve the real exchange rate (RER) volatility and risk-sharing puzzles. Cointegrated TFP or trend shocks generate significant income effects, compared to the stationary shocks, and amplify the mechanisms that produce high volatility in the RER. Moreover, trend shocks generate a low level of risk sharing as in the data for low and high values of trade elasticity parameters. For low values of trade elasticity, positive trend shocks lead to significant wealth effects and increase the prices of home tradable goods due to limited substitution. The resulting increase in home consumption and the appreciation of terms of trade generate negative correlation between relative consumptions and real exchange rates. For high values of trade elasticity, the existence of non-tradable sector is crucial for the risk-sharing puzzle. A positive trend TFP shock in the home country causes a strong income effect and increases the demand for non-tradable goods. In response, the price of non-tradable goods increases since tradable and non-tradable goods are complements. This leads to an appreciation of RER and breaks the tight link between relative consumption and RER.

3.4.7. Exchange Rate and Agriculture as well as Manufacturing Sectors

Most of the studies examining the impact of the exchange rate on sectors have concentrated on the manufacturing sector. However, Oyejide (1986) studied the effects of trade and exchange rate policies on agriculture in Nigeria. He found that Nigerian trade and exchange rate policies have had pervasive effects on agriculture through their influence on the sizes and prices of agricultural imports and exports as well as intermediate agricultural inputs and capital equipment. Estimates of effective

protection indicate that agricultural price intervention measures implemented largely through the trade and exchange rate regime appear to have increasingly protected domestic production of agricultural crops from external competition. Specifically, a tariff on imports falls almost entirely on producers of exportable goods. It may be inferred, therefore, that Nigeria's prevailing trade and exchange rate policies, which are designed largely to protect import-competing manufacturing activities, have also substantially reduced the relative incentive to produce export goods vis-à-vis home goods. The oil sector has had a significant adverse effect on agriculture. Also, Dutch disease as well as trade and exchange rate policies have had the cumulative effect of taxing agriculture.

David, Umeh and Ameh (2010) examined the impact of exchange rate fluctuations on the Nigerian manufacturing sector during a 20-year period (1986–2005). They confirmed that the coefficients of the variables carried positive and negative signs. The study actually shows adverse effect and is statistically significant in the final analysis. Yazici and Qamarul (2012) investigated the short-run and long-run impact of exchange rate on the trade balance of Turkish agriculture with EU (15) countries. They found that in the short run the real exchange-rate variable affects agriculture trade balance in trade with the EU (15) and the depreciation of the Turkish Lira improves the trade balance. As for the long-run impact of the exchange rate, depreciation of domestic currency has a statistically significant negative effect on the trade balance of agriculture.

Mensah, Awunyo-Vitor and Asare-Menako (2013) revealed that exchange rate volatility affects employment growth in manufacturing-sector firms in Ghana; that is, the depreciation of the Ghanaian currency against the US dollar significantly slows the rate of employment in the manufacturing sector in Ghana. Similarly, the interest rate has a negative relationship with employment growth in the Ghanaian manufacturing sector. However, GDP exhibits a positive relationship with employment growth. Through the prudent management of the exchange rate, employment in the manufacturing sector may experience significant growth. King-George (2013) examined the effect of exchange-rate fluctuations on the Nigerian manufacturing sector during a 25-year period (1986–2010). The researcher found that the exchange rate has no significant effect on the economic growth of Nigeria. Also, there is no significant effect of fluctuation on the exchange rate on the manufacturing sector.

Oyinbo, Abraham and Rekwot (2014) affirmed the existence of a unidirectional causal relationship between exchange rate and the share of the agricultural sector in the Nigerian GDP. They also confirmed the negative relationship between the variables in question. Oyinbo and Rekwot (2014) examined the relationship between deregulation in exchange rate and the share of the agricultural sector in Nigeria’s GDP and concurred with Oyinbo et al. (2014). Imoughele and Ismaila (2015) examined the impact of the exchange rate on non-oil export. The result shows three cointegrating

equations which establish the existence of a long-term relationship among the variables. Also, the study found that effective exchange rate, money supply, credit to the private sector and economic performance exert a significant impact on the growth of non-oil export in the Nigerian economy and appreciation of the exchange rate has a negative effect on non-oil export, which is consistent with the economic theory.

3.5. REMITTANCES AND DUTCH DISEASE

Acosta, Calderon, Fajnzylber and Lopez (2008) focused on whether rising levels of remittances result in the Dutch disease phenomenon in recipient economies. They found that, whether altruistically motivated or otherwise, an increase in remittances flow leads to a decline in labour supply and an increase in consumption demand that is biased toward non-tradables. The increase in demand for non-tradables, coupled with high production costs, results in an increase in the relative price of non-tradables, which further causes the real exchange rate to appreciate. The higher non-tradable prices serve as incentive for an expansion of that sector, culminating in reallocation of labour away from the tradable sector. This resource reallocation effect eventually causes a contraction of the tradable sector. Fayad (2010) investigated the potential Dutch disease threat of remittance inflows in a panel of net labour exporters in the Middle East and North Africa (MENA) region. He accounted for the empirically proven complementarity between international migration and inward foreign direct investments (FDI), and for the resulting simultaneity between inflows of remittances and FDI. He found that the stand-alone appreciative effect of remittances, usually found in the literature, is increasingly attenuated by the productivity-enhancing depreciative effect of simultaneous FDI. A threshold level of net FDI is found beyond which the appreciative real exchange rate effect of remittances turns depreciative. He also presented novel evidence on the reverse Dutch disease effect of large remittance outflows from the MENA net labour importers and major oil producers, using an augmented version of the Pooled Mean Group (PMG) estimator, which accounts for error cross-section dependence. Rabbi (2011) found that remittances flows positively affect the real exchange rates (RER) and negatively affect Bangladesh external trade competitiveness. Makhlouf and Mughal (2013) found that Persian Gulf remittances affect Dutch disease of Pakistan while those of North America and Europe do not.

Ratha (2013) analysed remittances and the Dutch disease relationship using evidence from cointegration and error-correction modelling. As expected, the results vary by country as well as the time frame (e.g. short run, long run, or both) under consideration. In particular, we find support for this phenomenon for the Philippines in the short run as well as China and Lesotho in the long run and none for India and Mexico. For India and China, the top two remittance destinations, it was FDI

(rather than remittances) that exhibited the syndrome in the short run, but the effects did not last into the long run. While such country and context-specific results do inhibit generalisations of the results, they also highlight the importance of more in-depth and country-specific studies. In the case of Rabbi et al. (2013), remittances positively influenced RER and negatively influenced external trade competitiveness of Bangladesh. Makhlouf and Mughal (2013) found evidence for spending and resource movement effects in the short and the long run. These impacts are stronger and different from those that the ODA and the FDI exert. They found that while aggregate remittances and those from the Persian Gulf contribute to the Dutch disease in Pakistan, those from North America and Europe do not.

Nikas and Blouchoutzi (2014) tested the applicability of Dutch disease for two small transition economies under a free-floating exchange-rate regime, namely Albania and Moldova. They found that the impact of the workers' remittances on the real exchange rate varies among the countries examined. The results confirmed that the macroeconomic implications of these large capital inflows have been different between the countries. Nsor-Ambala (2015) replicated the first part of Rajan and Subramanian's (2011) findings and then used a new, extended dataset, different estimation methods and another measure of aid to analyse the robustness of their results. In addition, the study explored the effect of remittance flows on the relative growth of manufacturing sectors. He found that the new extended data set did not provide sufficient evidence to support the "Dutch disease" argument. In the case of international remittance flows, he found a positive effect of remittance on manufacturing growth, particularly in fixed effects models.

CHAPTER 4
THE EFFECTS OF REMITTANCE INFLOWS ON EXCHANGE RATES IN NIGERIA

Abstract

Remittances have been a major source of economic support for dependents of migrant workers in their home countries. Nigeria receives the largest amount of remittances in Africa and the third among developing economies; receiving 21 Billion US Dollars in 2015.

Large remittance inflows could however hurt the recipient economy when the flows are significant relative to the size of the recipient economy. With increasing remittance inflows relative to other capital inflows into Nigeria, remittances could have undesired outcomes, with the possibility of the exchange rate appreciation and a loss of competitiveness in the tradable sector. Using the error correction model (ECM) and data covering 1980 to 2016, this paper explores the empirical evidence regarding the impact of remittances on the real exchange rate in Nigeria.

Our findings suggest that remittance inflows have been associated with a decline in the real exchange rate in Nigeria with its effect similar to foreign direct investment and foreign portfolio investment but different from the effect of foreign aid. The implication of the study findings is that an increase in remittance leads to the appreciation of the real exchange rate. Furthermore, the study found that foreign direct investment exerts a more appreciating effect on the domestic currency out of the four capital inflows considered in the study.

Key Words: *Dutch Disease, Remittances and Exchange Rate*
JEL Classification: *F40, F41, O10*

4.1. INTRODUCTION

The past two decades have brought a major shift in the international development finance landscape. Over the last two decades, the influx of remittance inflows into developing countries has been adjudged a source of foreign exchange in addition to other capital inflows such as foreign direct investment (FDI) and official development assistance (ODA). In Nigeria, for instance, remittance inflow has increased significantly. This has made it the highest source of foreign capital inflow. Between 1980 and 2011, remittance as a share of GDP stood at an average value of 3.5 per cent. This is found to be higher than what was recorded for FDI and ODA, which were 3.1 per cent and 1.1 per

cent respectively, thus further highlighting the importance of remittance to an economy in relation to FDI and ODA.

Remittances received by Nigeria came to $22 million in 1980; increased to $56 million in 1992, and started to experience consistent increases until 2004 when it was $2.4 billion. In subsequent years, remittances surged from $14.6 billion and reached $20.9 billion in 2012 (World Bank, 2014). The average remittance in the period 1980 to 1990 in Nigeria was $10.9 million. The situation changed in the 1990s, with Nigeria's average remittance between 1991 and 2000 increasing to $855.76 million. There was a further phenomenal increase in Nigeria's remittances from $1.16 billion in 2001 to $22.97 billion in 2013 (World Bank, 2014).

The steady and sharp rise in Nigeria's remittance inflows is reflected in Figures 4.1 and 4.2. Figure 4.2 shows the relative importance of remittance in Nigeria's economy, depicted by the share of remittances in the GDP. It is seen that remittances have gradually assumed a greater proportion of GDP, starting especially from the 1990s, where remittances as a share of GDP for the decade fluctuated between two per cent and six per cent. In the 2000s, remittances as a share of GDP rose to a peak of 13 per cent in 2005, but there was a low of 1.57 per cent in 2003. Thus, this decade had the highest ratio of remittances but also the highest volatility in the proportion of remittances to GDP.

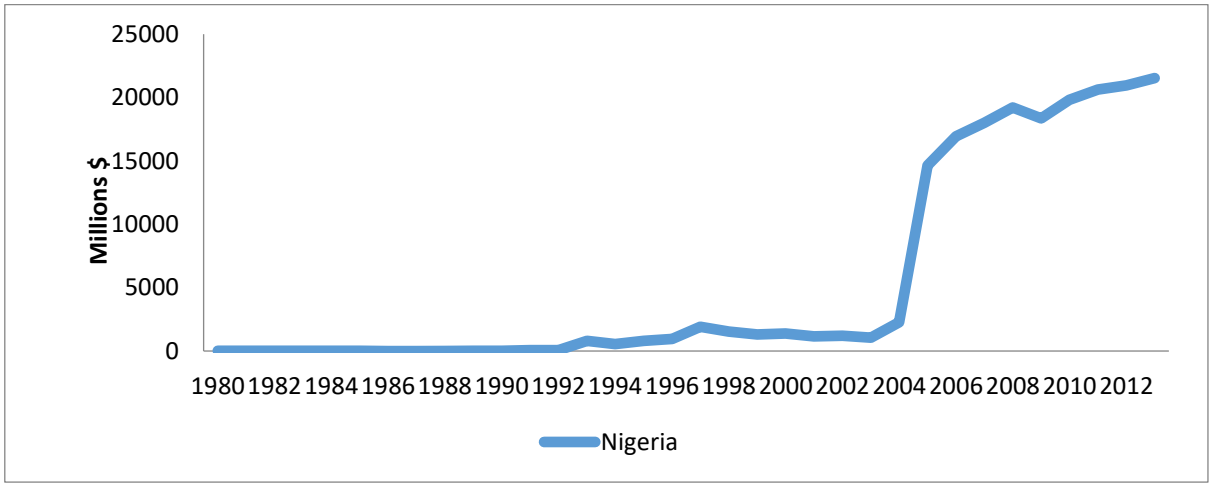


Figure 4.1: Remittances Received in Nigeria (Million $)
Source: World Bank, 2014.

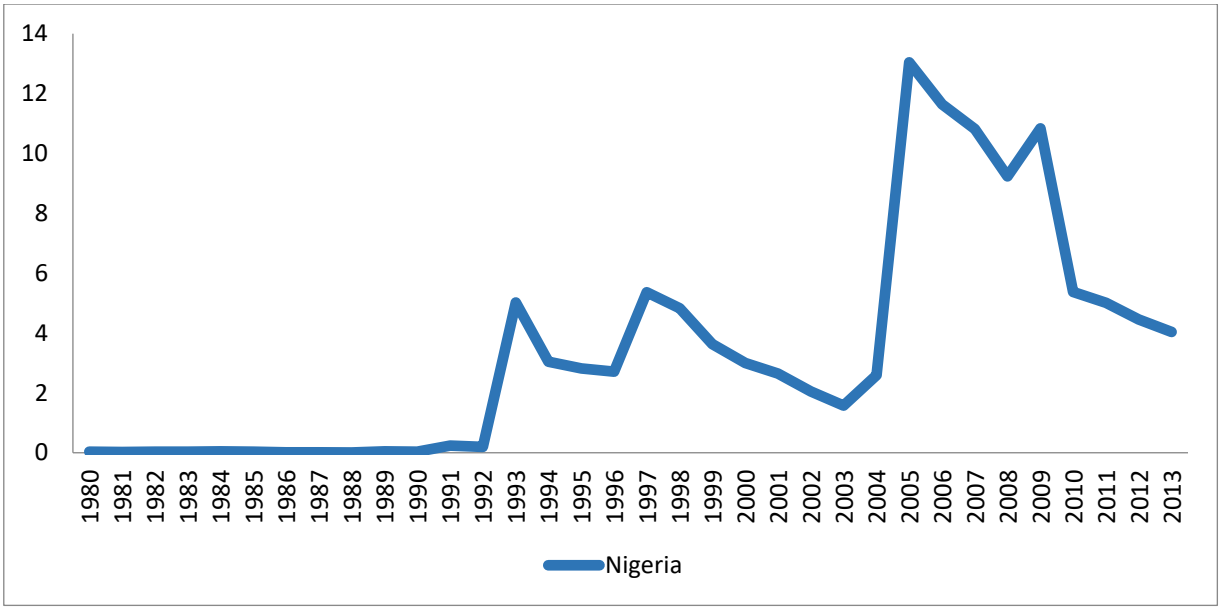


Figure 4.2: Remittances Received as % of GDP in Nigeria
Source: World Bank, 2014.

Based on the continuous influx of remittance flow into developing countries, two strands of thought have emerged. The first advocates remittance as a vehicle for economic development (Stark & Lucas, 1988). This is based on the premise that remittance serves as a source of funds for investment in the recipient countries, thus enhancing economic activities resulting in an overall improvement in economic performance. In addition, it serves as insurance to the migrant workers during times of crisis (Makhlouf & Mughal, 2013).

The second strand examined the negative consequence of remittance flows as a source of loss of competitiveness for import-dependent remittance recipient economies such as Nigeria. Here, remittances inflow is assumed to lead to the appreciation of real exchange rate, through a rise in the non-tradable goods relative to tradable goods associated with an increase in households' disposable income that comes with remittance inflow. Thus, the additional demand arising from remitted money raises prices in the non-tradable sector while the prices cannot move much in the tradable sector in a small open economy, resulting in the appreciation of the real exchange rate.

An examination of the movement of the exchange rate in Nigeria indicates a similar trend to remittance inflows. Figure 4.3 describes the nature of the movement between remittances and exchange rates in Nigeria. The figure depicts that the two variables co-move in an upward direction over time. For the 1980s, remittances and exchange rates were low and did not vary much. For the 1990s, variables started experiencing gradual increases, while the decade of the 2000s was characterised by a surge in remittances that was accompanied by a rise in real exchange rates in

Nigeria. This suggests that the two variables exhibit positive co-movement, an indication that as remittances increase, the exchange rate rises in the same direction. Thus, it would be imperative to carry out an investigative analysis on the relationship between remittances and exchange rates in Nigeria.

From the above, this study set out to understand whether remittance inflow leads to real exchange rate appreciation in Nigeria as predicted by theory. Theory predicts that capital inflow through its income and substitution effects leads to a consumption boom manifesting in an increase in demand for both tradable and non-tradable goods and consequently a rise in current account deficit. The supply of non-tradable goods is limited when compared to tradable goods, thus increasing the price of non-tradable goods relative to tradable goods and leading to an appreciation of the real exchange rate. Remittance inflow follows similar channels, thus this study sought to compare the effect of remittance on real exchange rate relative to three other capital inflows, namely foreign aid, foreign direct investment, and foreign portfolio investment.

Table 4.1 Capital Flows Volatility in Nigeria

	Personal Remittances Volatility	Portfolio Investment Volatility	Aid Volatility	FDI Volatility
Mean	0.4047	0.8809	0.3311	0.4192
Minimum	0.0063	0.0296	0.0079	0.0027
Maximum	1.485	2.4514	1.5988	2.224
Standard Deviation	0.4588	0.5652	0.4059	0.4616

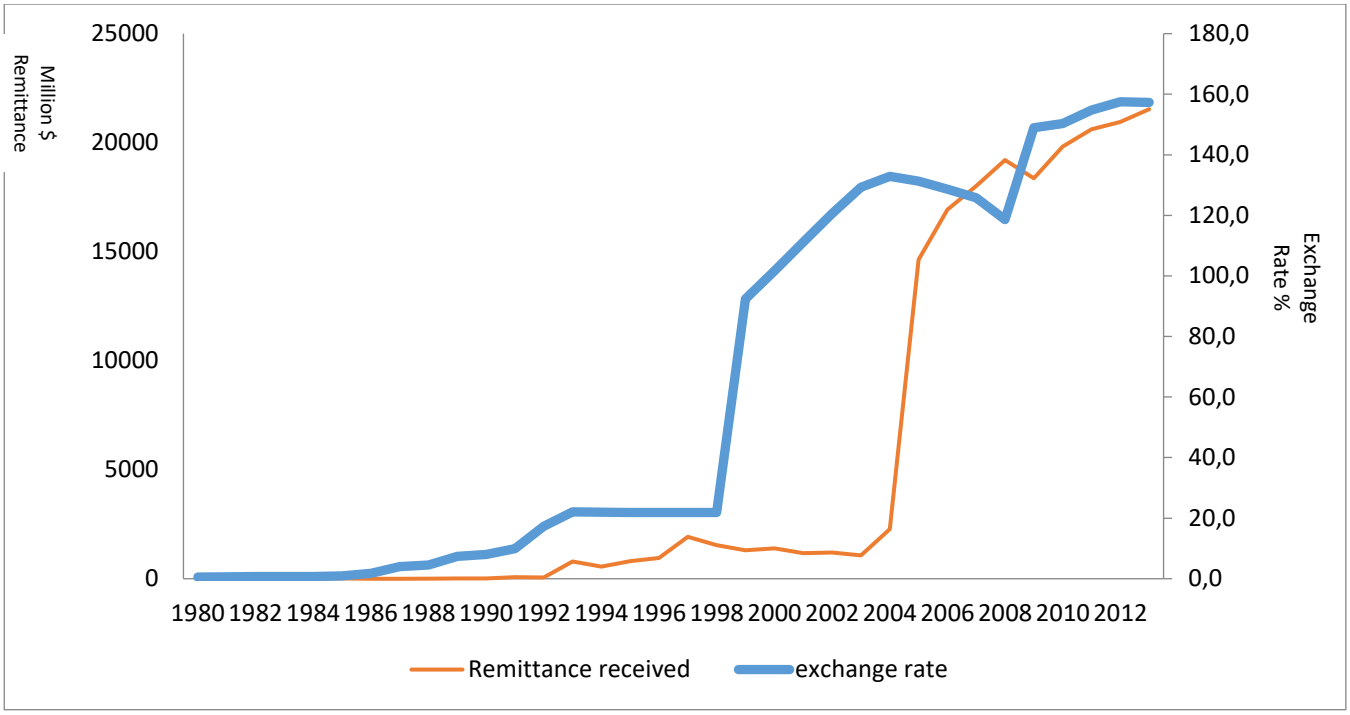


Figure 4.3: Remittances Received and Exchange Rate in Nigeria
Source: World Bank, 2014.

4.2. LITERATURE REVIEW

4.2.1. Theoretical Review

Remittance inflows can be regarded as capital inflows, thus the study by Acosta, Lartey and Mandelman (2009) highlighted theoretically how an increase in remittance inflows leads to a decline in the real exchange rate. The overarching conclusion from the study is that remittance inflows, like other capital flows, adversely affect the recipient economy through the appreciation of the real exchange rate, since this leads to loss of the competitiveness of the recipient economy's exports.

The Salter-Swan-Corden-Dornbusch model has been extensively used in the literature to explain the effects of capital inflows on real exchange rate. Based on this model, an increase in capital inflows is expected to lead to exchange rate appreciation through its spending effect. Because of spending effects, capital inflows contribute to an increase in the demand in the tradable sector, which further worsens the trade deficit condition. Conversely, the spending effects lead to an increase in the demand in the non-tradable sector. Due to limited supply in this sector, excess demand for non-tradable goods

leads to price increases (Acosta et al., 2009). Since relative prices of tradable goods and non-tradable goods determine the real exchange rate, excess demand for non-tradable goods because of an increase in capital inflows leads to a rise in the price of non-tradable goods relative to tradable goods, thus suggesting an appreciation of the real exchange rate.

Compared to tradable goods, the supply of non-tradable goods is limited. As a result, the firm responds to the rise in the demand for non-tradable goods by adjusting prices upward. While the prices of tradable goods are relatively fixed, the prices of non-tradable goods are not, but adjust to market conditions. In the presence of a surge in remittance, household income increases. Consequently, there is excess demand for non-tradable goods, which in turn contributes to an increase in the price of non-tradable goods relative to tradable goods, thus representing an appreciation of the exchange rate (Amuedo-Duorantes & Pozo, 2004; Acosta et al., 2009).

The other channel is through the labour market. Remittance increases the reservation wage of labour, which in turn increases labour leisure time. This increases the cost of production in the non-tradable sector, which is assumed to be labour intensive. Consequently, the price of non-tradable goods increases, leading to the appreciation of the real exchange rate, since the price of the tradable goods is relatively unaffected by the domestic market conditions. The other channel recognises the effect of the labour market on how remittance inflow affects real exchange rate.

4.2.2. Empirical Review

The surge in remittances over the past two decades has renewed interest in understanding how it affects the macroeconomy of recipient countries. A central feature of such interest has been how exchange rates are affected in such recipient economies. Thus, several studies have been conducted to investigate how exchange rates are affected by remittances in recipient economies. We provide a review of such studies below.

Using disaggregated sectoral data comprising panel data of 109 developing economies, Acosta et al. (2008) examined the impact of remittances on real exchange rates. The study covered the period spanning from 1990 to 2003, using the GMM and ordinary least squares (OLS) country fixed effects. It was found that an increase in remittance inflows in developing economies led to an increase in spending, resulting in an increase in prices of non-tradable goods. The price increases consequently led to real exchange appreciation.

Acosta et al. (2009) obtained a similar result confirming that remittances lead to real exchange rate appreciation. The study suggested that countries with more sophisticated financial markets are better

equipped to alleviate the macroeconomic challenge of appreciation of the local currency whilst maintaining a competitive stance. Using the same data, they also postulate that if depreciation occurs, the amount by which the currency depreciates depends on the ability of the domestic economy to channel remittances towards investment. In another study, Acosta et al. (2009), employing a Bayesian methodology, estimated the impact of increases in remittances on the Salvadorian economy. The results show that remittances lead to macroeconomic instabilities. They argued that an increase in remittances results in an increase in household income and, consequently, an increase in non-tradable products. The empirics showed that the conventional view of exchange rate appreciation is upheld.

The degree of openness of the recipient economy was identified by Barajas et al. (2010) as a main determinant of the size of impact of remittance inflows on the exchange rate. Using panel cointegration techniques on Middle Eastern and Central Asian countries, they found that foreign exchange appreciation is weakened or overturned outright by the sensitivity of a country's risk premium, domestic factor mobility, as well as share of consumption in tradables and counter cyclicality of remittances.

Using a panel cointegration approach, Hassan and Holmes (2016) assessed the long-term relationship between the real exchange rate and remittances for less developed economies. The results revealed that remittances lead to real exchange-rate appreciation. A panel ECM was developed which showed there is causality from remittances to the real exchange rate in the short run. This finding is also similar to that of Combes et al. (2011), where the same technique was applied in an analysis of the implications of capital flows and exchange rate flexibility on the real exchange rate in developing economies. The results show that public and private flows are associated with real exchange rate appreciation.

Barajas et al. (2010), employing a panel cointegrating methodology, found that the effect of remittance flow on the equilibrium real exchange rate is not very robust since the sign and the level of statistical significance of the effect is dependent on the country sample being analysed and also on the other explanatory variables in the model. The robustness checks provide evidence that the countries with low trade and/or capital account openness would most likely display the conventional effect of exchange rate appreciation. It was also found that countries of the Middle-East and North Africa are likely to experience real exchange rate appreciation due to increases in remittances inflow.

Amuedo-Dorantes and Pozo (2004) tested the impact of workers' remittances on the real exchange rate on 13 Latin American and Caribbean economies using fixed-effect OLS, considering the use of instrumental variables to account for the possibility of endogeneity. The results highlighted the fact

that remittances can lead to the appreciation of the real exchange rate in the recipient economy. It was found that "a doubling of remittances to GDP ratio would lead to a real exchange rate appreciation of above 22%". Foreign aid, however, was not statistically significant in this model for exchange rate determination. Using cointegration techniques and a panel VAR model, Izquierdo and Montiel (2006) focused on six economies from Central America and the Caribbean for the period 1985 to 2004. Contrary to most findings, they revealed that for Honduras, Jamaica and Nicaragua remittances have no effect on the real exchange rate. In Dominica it was revealed that remittances led to real exchange rate depreciation, while for El Salvador, it had an appreciating effect. Evidently, most studies that are highlighted here, apart from the study completed by Izquierdo and Montiel (2006), point to the fact that an increase in remittances results in an appreciation in the real exchange rate.

Kemegue et al. (2011) investigated the effect of remittance inflows on the real exchange rate in Sub-Saharan Africa (SSA) using annual data spanning 1980 to 2008 for 34 SSA countries. The authors used the GMM by Arellano and Bover (1995) and feasible generalised least squares by Parks (1967) and Kmenta (1986) in their study. After controlling for cross-sectional dependence and individual effects, the authors claimed that remittances to SSA lead to real exchange rate appreciation in recipient countries.

Rabbi et al. (2013) examined the impact of the inflow of workers' remittances on the Bangladesh economy via real exchange rate using data spanning 1971 to 2001. The authors made use of the Johansen cointegration test and vector error correction model (VECM) methodology and found that inflow of remittances leads to appreciating of the real exchange rate and hence contributes to a decline in Bangladesh external trade competitiveness. The authors recommended a gradual relaxation of the trade barrier and promotion of external trade diversification as well as the diversion of the remittances inflow from non-tradable sectors to priority investment areas to counteract the adverse consequences of remittances inflow on the Bangladeshi economy in the long run. Existing studies do not examine the effect of remittances on real exchange rate in addition to other capital inflows. This study, therefore, sought to compare the effect of remittance on real exchange rate relative to three other capital inflows, namely foreign aid, foreign direct investment and foreign portfolio investment.

4.3. EMPIRICAL ANALYSIS

4.3.1. Model Specification

This study is concerned with conducting an empirical analysis of the effects of remittances on Nigeria's exchange rate. We specify our econometric model by drawing from previous studies (Fayad, 2010) to specify an exchange rate model where the real exchange rate is a function of

remittances and a host of other control variables. The general specification of the model takes the form depicted in equation (1):

$$REERA_t = \alpha_0 + \alpha_1 REMI_t + \alpha_2 X_t + \varepsilon_t \quad (1)$$

where REERA = real effective exchange rate

REMI = remittances

X = a vector of control variables

The vector of control variables, X, can be expanded to include a host of macroeconomic variables. This expansion gives equation (2) below:

$$REERA_t = \emptyset_1 + \emptyset_2 REMI_t + \emptyset_3 AID_t + \emptyset_4 FDI_t + \emptyset_5 OILP_t + \emptyset_6 FPI_t + \varepsilon_t \quad (2)$$

where

ϕ is the parameters for the equation

ψ is the error term for the equation

$REERA_t$ is the logarithm of the real effective exchange rate;

$REMI_t$ is the logarithm of real remittances inflows;

AID_t is the logarithm of real aid inflows per capita;

FDI_t is the logarithm of net foreign direct investment;

$OILP_t$ is the logarithm of price of oil;

FPI_t is the logarithm of foreign portfolio investment.

4.3.2. Econometric Methodology

Ever since the seminal papers of Granger and Newbold (1974) which identified regressions undertaken with non-stationary data as suffering from unit root problems as well as Engle and Granger's (1987) paper which proposed cointegration techniques as a way of dealing with nonstationary data, empirical economists have typically adopted various stages in undertaking econometric investigations. The first stage is usually testing the data for unit roots. This is typically followed by testing for cointegration. A third stage usually involves estimating either short-run or

long-run coefficients of the explanatory variables of the model, depending on the results of the cointegration tests.

4.3.2.1. Unit Root Tests

Economic and financial time series have non-stationarity properties. Examples of such series are asset prices, macroeconomic aggregate like real GDP and exchange rate. The main sources of non-stationarity are trend and structural break. There are two types of trends (random and non-random). An example of non-random trend is deterministic trend, while random trend includes stochastic trend, which is not observable. The major econometric task is to determine the sources of non-stationarity and correct them before any meaningful analysis can take place (Sjö, 2008).

There are several ways to make a non-stationary variable stationary. This includes differencing, detrending or adding a dummy in the case of a structural break. Detrending is only required if the data has some form of trending and the number of differencing depends on the order of integration. Unit root testing is used to determine if the trending data should be differenced or detrended in order to make the series stationary.

There are diverse types of unit root testing: the Dickey Fuller test, Augmented Dickey Fuller (ADF) test, Phillips Perron (PP) or Kwiatkowski-Phillips-Schmidt-Shin (KPSS) stationarity test. The Dickey Fuller test is a good test of stationarity but it has the drawback of assuming the error term is white noise. However, the ADF takes care of this shortcoming by controlling for white noise property of the error term. The flaw of the ADF is its ability to reject the null of unit root in small samples. On the other hand, the PP has the advantage of performing better in small and large samples and also correcting for autocorrelation and heteroscedasticity. In addition, it does not require specification of lag length (Sjo, 2008). However, it has the weakness of not rejecting the null hypothesis if the AR(1) process is close to unity. This observed shortcoming of PP is addressed in KPSS.

In the case of KPSS, the null hypothesis is that the series is stationary, therefore it is referred to as a stationarity test. It takes care of autocorrelation and heteroscedasticity in the error term. It also has a high power as it performs well on small and large samples. Moreover, the specification of the series must include trend because it is trend stationary.

4.3.2.2. Cointegration Test

Once the order of integration of a series is known, it is possible to establish a relationship among series of difference of integration and make standard inferences from the variables. The process of

creating stationarity among nonstationary variables is called cointegration. A cointegration test is a necessary procedure to determine whether the series of a model have a fixed long-run relationship.

One of the earliest approaches was proposed by Engle and Granger (1997). The advantage of this test is that it is intuitive and easy to perform. The test proceeds in two steps: the first starts by estimating the so-called cointegrating regression where all variables must be of the same order of integration. This equation represents an economically meaningful equilibrium relationship among the variables. If cointegration exists among the variables, they will share a common trend and show that there is a long-term relationship among the variables. In the second step, a unit root test is carried out on the resulting residual. The ADF can be performed for determining the lag length so that the errors become white noise, which is very important.

There are three main problems with the test. First, since ADF is performed on the test, the problems associated with the ADF test are valid here too. Second, the assumption of one cointegration vector from the cointegration regression is central so necessitating extra care when more than two variables are involved. Third, a common factor in the dynamics of the system is assumed. All these problems lead to formulation of the superior Johansen cointegration test, which was employed in this study.

The Johansen test is superior because it has all the desirable statistical properties: its only weakness is that it is based on asymptotic properties and is therefore sensitive to specification errors in limited samples. There are two main tests in Johansen's test, namely the max eigenvalue and trace. The null hypothesis is that there exists r cointegrating vectors against the alternative of r+1 vector. Once the basic tests have been performed, conclusions can be drawn on the number of cointegrating equations based on the two main tests. Conclusively, the trace test is considered to be superior to the max eigenvalue because of its robustness to skewness and excess kurtosis (Sjö, 2008).

4.3.2.3. Error Correction Model

Our econometric methodology in this paper followed the common established practice in time series econometrics as outlined above, thus we estimated an ECM. This approach was adopted due to the nature of our variables. The approach comes with a number of advantages. First, it enables us to determine both the short-term and long-term effects of remittance alongside other capital flows. Second, the approach provides information about the speed of adjustment once shock occurs. Equation (3) is the model that will be estimated.

$$\Delta REERA_t = \emptyset_1 + \emptyset_2 \Delta REMI_t + \emptyset_3 \Delta AID_t + \emptyset_4 \Delta FDI_t + \emptyset_5 \Delta OILP_t + \emptyset_6 \Delta FPI_t + \rho ECT(-1) + \varepsilon_t \quad (3)$$

4.4. EMPIRICAL ANALYSIS

4.4.1. Unit Root Tests

The first stage of our empirical analysis consisted of examining the time series properties of the data by conducting unit root tests. Prior to proceeding with the unit root tests, we present descriptive statistics of the data in Table 4.1.

The descriptive statistics in Table 4.1 show the distribution of REER, REMI, FDI, FPI, AID and Oil price. From the table, the highest mean and median values are recorded by FDI with the value of 2482.88 and 1268.00 respectively, REMI has the highest value in term of the maximum (22977.45) and the lowest minimum value (2.42) in absolute term. The standard deviation shows the deviation of the series from the mean and FPI recorded the highest deviation from the mean with a value of 3074.56. The skewness in the series are very small with the exception of FPI and AID which skew significantly rightwards. In terms of the kurtosis, REMI, FDI and oil price are leptokurtic but REER, FPI and AID suggest some outliers. Jarque-Bera which shows the normality of the series suggest that most of the series are not normally distributed as their probability value are significant at 5 per cent.

Table 4.2 Descriptive Statistics

	REER	REMI	FDI(Million)	FPI(Million)	AID(Million)	Oil Price
Mean	158.860	5519.375	2482.882	1327.565	1032.196	39.426
Median	95.201	1004.705	1268.000	208.490	233.020	28.640
Maximum	540.848	22977.450	8841.953	14992.460	11428.020	99.670
Minimum	49.284	2.420	-738.870	0.000	31.710	14.420
Std. Dev.	129.408	8422.027	2735.977	3074.560	2203.440	27.020
Skewness	1.510	1.122	1.164	3.451	3.643	1.176
Kurtosis	4.323	2.387	2.962	14.501	16.601	2.967
Jarque-Bera	15.406	7.668	7.681	254.891	337.266	7.842
Probability	0.000	0.022	0.021	0.000	0.000	0.020
Observations	34	34	34	34	34	34

The results of the unit root tests are presented in Table 4.2. The ADF and PP tests have the same null hypothesis, that the series has a unit root; while the null hypothesis of the KPSS test is that the series are stationary. From Table 4.2, it is seen that for the ADF and PP tests we can reject the null hypothesis

of a unit root for all variables in first differences, with the exception of the ADF test for REMI. Also, for the KPSS test we accept the null hypothesis that the series are stationary in first differences. Thus, we can conclude from all unit root tests that all variables are stationary in first differences, that is integrated of order one, I(1). This implies that although the variables were not stationary in level, they are in first difference.

Table 4.3: Unit Root Tests

	ADF			PP			KPSS	
Variable	Constant	Constant and Trend	None	Constant	Constant and Trend	None	Constant	Constant and Trend
Level								
REER	-1.997	-2.687	-0.711	-2.158	-2.132	-0.681	0.290***	0.114***
REMI	-1.318	-1.564	-1.387	-1.240	-1.475	-1.387	0.578**	0.142**
AID	-1.239	-3.411*	1.361	-1.159	-2.620	1.557	0.651**	0.056***
FDI	-1.417	-1.765	-0.401	-1.562	-1.928	-0.399	0.543**	0.111***
OILP	-2.057	-2.224	-0.936	-2.072	-2.224	-0.939	0.207***	0.177***
FPI	-1.417	-1.765	-0.401	-1.562	-1.928	-0.399	0.543**	0.111***
First difference								
REER	-4.576***	-4.562***	-4.613***	-4.483***	-4.385***	-4.531***	0.076	0.043
REMI	-3.003***	-6.912***	-2.897**	-6.875***	-6.882***	-6.672***	0.116	0.080
AID	-5.504***	-5.428***	-5.216***	-5.064***	-5.133***	-4.599***	0.101	0.098
FDI	-4.025***	-3.841***	-4.121***	-4.016***	-3.809***	-4.104***	0.179	0.163
OILP	-5.804***	-5.758***	-5.830***	-5.803***	-5.756***	-5.829***	0.199	0.136
FPI	-5.687***	-6.247***	-5.524***	-7.040***	-6.833***	-7.154***	0.133	0.120

Notes: ***, **, * indicate significance at the 1% level, 5% and 10% respectively

4.4.2. Johansen Cointegration Test

Since all variables are I(1), the conditions for using the Johansen cointegration test have been met. Before proceeding with the Johansen cointegration test, we performed a lag length criteria test and the results obtained are presented in Table 4.3. Based on the results, we selected lag 4 as the optimal lag using the result obtained under Schwarz information criterion (SC) and then proceeded with our Johansen test using one lag.

Table 4.4: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-963.746	NA	1.35e+18	58.773	59.045	58.864
1	-854.694	171.840	1.67e+16	54.345	56.250	54.986
2	-817.910	44.587	2.01e+16	54.298	57.835	55.488
3	-780.372	31.851	3.67e+16	54.204	59.374	55.944
4	-662.792	57.008*	1.63e+15*	49.260*	56.062*	51.549*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Therefore, we can proceed with the cointegration test to test for a long-run stable relationship between the exchange rate and remittances, while also taking other control variables into account. Tables 4.4(a) and (b) show the results of the Johansen cointegration test and contain the trace test and maximum eigenvalue test. Both test statistics indicate the presence of cointegration in our model across the various assumptions. Specifically, judging based on linear intercept and trend as reported in Table 4.4(b), the trace test and the maximum eigenvalue test show two (2) co-integrating equations each. For long-run relationship to hold, from both tests, there must be at least one co-integrating equation, which is satisfied in this study. Thus, from the results in Tables 4.4(a) and (b), it can be concluded that in Nigeria there is a stable long-run relationship between exchange rate, remittances and other variables as expressed in equation 2.

Table 4.5(a): Johansen Cointegration Test Summary

Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	1	2	2	2	3
Max-Eig	1	2	2	2	2

*Critical values based on MacKinnon-Haug-Michelis (1999)

Table 4.5(b): Johansen Cointegration Test Based on Liner Intercept and Trend Assumption

Null Hypothesis	Trace Test Statistics	Maximum Eigenvalue Statistics
H_0: r = 0	127.56***	47.08***
H_0: r ≤ 1	80.48***	41.49***
H_0: r ≤ 2	38.99	15.04
H_0: r ≤ 3	23.95	12.06
H_0: r ≤ 4	11.88	9.54
H_0: r ≤ 5	2.34	2.34

Notes: ***, ** denotes significance at the 1%, 5% level
r denotes the number of cointegrating vectors

4.4.3. Long-term Results

The long-term effects of remittance alongside other capital flows – foreign aid, foreign direct investment and foreign portfolio investment on real exchange rate – are presented in Table 4.5. The sign of the coefficient of remittance on real exchange rate is the same with other capital flows such as foreign direct investment and portfolio investment but different from foreign aid. Remittance, foreign direct investment and foreign portfolio investment have a negative sign while foreign aid has a positive sign, with the effect statistically significant for all the capital flows. Specifically, an increase in remittances causes the real effective exchange rate to fall and hence results in the appreciation of the domestic currency, such that doubling of remittances is expected to lead to an appreciation of the domestic currency by 10.2 per cent.

For the other capital inflows, an increase in foreign direct investment by 100 per cent is expected to lead to a decrease in real exchange rate by 26 per cent and the effect is statistically significant at five per cent. Similarly, an increase in foreign portfolio investment by 100 per cent leads to an increase in real exchange rate by 1.5 per cent and the effect is statistically significant at five per cent, while an increase in foreign aid by 100 per cent causes the real exchange rate to increase by 38.7 per cent and the effect is statistically significant at five per cent.

For the other variables in the model, the oil price was found to have a statistically significant and negative effect on the real exchange rate. Thus, an increase in oil price by 100 per cent is expected to lead to a decrease in real exchange rate by 84.9 per cent. The implication of this is that an increase in world oil prices exerts appreciating pressure on the Nigerian currency and a depreciating effect when the price falls. This has a serious implication for the country, given its oil dependency.

Table 4.6: Regression Results using ECM

Regressors	**Coefficient**
REM Remittance	-0.102*** (0.028)
LAID Aid	0.387** (0.249)
LFDI Foreign Direct Investment	-0.260*** (-0.114)
OILP Oil Price	-0.849*** (0.150)
FPI Portfolio investment	-0.015*** (0.004)

Note: standard error in parenthesis and *, ** and *** depict significance at the 10%, 5% and 1% levels respectively

4.4.4 Short run results

The result of the short-run analysis is reported in Table 4.6. The sign of the coefficient of remittance is the same with the three other forms of capital flows - foreign aid, foreign direct investment, and foreign private investment in the short-run, although the coefficients were not significant at 10% statistically significance level. An increase in remittances as well as other capital inflows causes the real effective exchange rate to fall and hence results in the appreciation of the domestic currency.

The coefficient of the error term is negative and significant, pointing out that whenever there is disequilibrium from long-run, 44% of the shock is absorbed within the year of occurrence. The coefficient of the ECT suggests that the speed of adjustment to long-run from short-run disequilibrium is slow.

A number of diagnostic check were performed. They are Normality test, Breusch-Godfrey serial correlation LM test, and ARCH heteroscedasticity test. Our estimated model passed all the above highlighted tests. This is because the null of normality was accepted under the normality test, the null of no serial autocorrelation was accepted under the Breusch-Godfrey serial autocorrelation test, and the null of homoscedasticity was accepted under the ARCH heteroscedasticity test. Thus, validating reported results.

Table 4.7: Regression analysis – Short Run Results

Variable	Dependent Variable: Real Exchange Rate	
	Coefficient	Standard Error
Short-run: dependent variable ΔREER		
Constant	-0.032	0.081
ΔREMI	-0.002	0.175
ΔAID	-0.060	0.085
ΔFDI	-0.132	0.095
ΔOILP	0.242	0.414
ΔFPI	-0.081	0.057
ECT(-1)	-0.440**	0.189
Adjusted R-Squared	0.07	
D-W	1.38	
Normality	0.16	
Breusch-Godfrey Serial Correlation LM Test	0.10	
Heteroskedasticity test: ARCH	0.99	

4.5. TRANSMISSION OF SHOCKS TO THE EXCHANGE RATE

We now proceed to examine the possible channels through which shocks in remittances and the other explanatory variables are transmitted to the exchange rate in Nigeria. The results of the variance decompositions are presented in Table 4.7. Variance decomposition shows the proportion of the forecast error variance of a variable that is attributable to its own innovations and other variables. The third column of Table 4.7 shows the contributions of the forecast error variance of real exchange rate attributable to its own innovations and those due to the innovations of the explanatory variables, most especially capital flows, remittance, AID, FDI and FPI. It is seen from the table that in the first period, 100 per cent of the forecast error variance of real exchange rate is attributable to its own innovations. This share declines with time: it fell to 22.981 per cent in the 36th period.

The share of the contribution of remittance to real exchange rate forecast error variance rose from zero (0) in the first period to 16.389 per cent in the 10th period and then increased further to 19.598

per cent in the 20th period and reached 20.816 per cent in the 36th period. Over the periods, we observed that the forecast error variance increased at a gradual rate. When compared to other capital flows considered in the study, we observed that within the ten periods, remittance contributed the second highest after foreign direct investment, the real exchange rate forecast error variance and the trend was sustained until the 36th period.

In the 36th period, foreign direct investment contributed 38.957 per cent to the forecast error variance in the exchange, being the highest. This was followed by remittance contributing 20.826 per cent, foreign private investment contributing about 6.223 per cent while foreign aid contributed the least, about 4.751 per cent of the total forecast error variance.

Table 4.8: Variance Decompositions of Real Exchange Rate

Variance Decomposition of LREER:							
Period	S.E.	LREER	LREM	LAID	LFDI	LOILPRICE	PORT
1	0.351	100.000	0.000	0.000	0.000	0.000	0.000
2	0.565	86.574	3.968	0.0136	7.071	2.373	0.001
3	0.744	68.748	5.391	0.008	23.080	2.699	0.075
4	0.913	54.358	8.465	0.160	28.974	4.864	3.179
5	1.086	45.625	10.787	0.432	30.996	6.123	6.037
6	1.225	40.752	11.853	1.085	33.032	6.686	6.591
7	1.353	37.232	13.350	1.711	34.754	6.526	6.427
8	1.474	34.621	14.675	2.300	35.573	6.442	6.390
9	1.593	32.578	15.865	2.720	36.058	6.448	6.331
10	1.698	31.017	16.389	2.995	36.775	6.477	6.347
11	1.797	29.713	16.968	3.185	37.221	6.473	6.440
12	1.892	28.770	17.485	3.404	37.449	6.444	6.447
13	1.982	28.019	17.959	3.620	37.592	6.426	6.385
14	2.067	27.386	18.282	3.762	37.812	6.399	6.358
15	2.148	26.829	18.586	3.870	37.967	6.384	6.364
16	2.227	26.382	18.854	3.977	38.074	6.369	6.344
17	2.303	25.999	19.073	4.072	38.169	6.361	6.326
18	2.376	25.658	19.264	4.143	38.266	6.348	6.321
19	2.446	25.360	19.439	4.211	38.340	6.338	6.312
20	2.515	25.101	19.598	4.275	38.403	6.329	6.295
21	2.582	24.866	19.730	4.328	38.466	6.322	6.288
22	2.647	24.652	19.854	4.373	38.523	6.315	6.284
23	2.711	24.461	19.966	4.417	38.571	6.309	6.276
24	2.773	24.288	20.068	4.458	38.615	6.303	6.267
25	2.834	24.128	20.160	4.493	38.658	6.298	6.263
26	2.893	23.980	20.246	4.526	38.696	6.293	6.259
27	2.952	23.846	20.325	4.557	38.731	6.289	6.253
28	3.009	23.721	20.397	4.585	38.764	6.285	6.248
29	3.065	23.605	20.464	4.611	38.794	6.281	6.245
30	3.120	23.497	20.527	4.635	38.822	6.278	6.241
31	3.174	23.398	20.585	4.658	38.848	6.275	6.237
32	3.228	23.303	20.639	4.679	38.873	6.272	6.234
33	3.280	23.215	20.691	4.699	38.896	6.269	6.231
34	3.332	23.132	20.739	4.717	38.918	6.267	6.228
35	3.382	23.054	20.784	4.735	38.938	6.264	6.225
36	3.432	22.981	20.826	4.751	38.957	6.262	6.223

4.6. ROBUSTNESS TESTS

Here we deployed structural break unit root test and cointegration test to validate our previous estimates obtained using the traditional approach. The importance of unit root test is rooted in economic theory. Perron (1989) argued that unit root and structural breaks are related, inability to account for structural breaks, which are usually embedded in macroeconomic data due to changes in the structure of the economy, when the traditional unit root approach such as ADF, PP and KPSS are used might lead to incorrect inference. Perron (1989) pointed out that the use of traditional unit root test is biased towards false unit root when the data are trend stationary with structural break. In other words, non-stationarity of macroeconomic data can be attributed to structural changes in the economy. This inaccuracy in the traditional unit root test is addressed through the inclusion of structural break date into the unit root equation (Zivot and Andrew, 1992; Perron, 1989; Perron, 1998). Perron (1989) developed the first unit root test with structural break date, although the break date is determined exogenously. Subsequent approach by Zivot and Andrews, 1992; Banerjee et al 1992; and Perron, 1997 innovate and incorporate endogenously determined single break date from the data.

In this study, Perron (1997) structural break unit root test is used. This test includes the time trend and the time at which structural change occurs. The results obtained are reported in Table 4.8. It shows that in level some of the variables used in the study exhibit unit root but in first difference all the variables became stationary. Our finding here is consistent with the results obtained under the traditional unit root test as reported in Table 4.2.

Table 4.9: Structural Break Unit Root Test – Perron (1997)

Variable	Intercept only		Both intercept and trend	
	t-statistics	Break point	t-statistics	Break point
	Level			
LREER	-5.516***	1999	-4.300	2005
REM	-5.554***	1996	-5.291**	2007
LAID	-4.324	2003	-5.081*	2004
LFDI	-5.598***	2004	-5.358**	2004
LFPI	-3.535	1994	-5.880***	1998
OILP	-3.377	2003	-3.691	1996
	First difference			
LREER	-5.154**	1999	-10.770***	1998
REM	-6.682***	1993	-7.170***	1993
LAID	-7.332***	2005	-6.377***	2005
LFDI	-11.247***	2010	-5.358**	2004
LFPI	-6.753***	1999	-7.000***	1999
OILP	-6.240***	2008	-6.174***	2008

Notes: ***, **, * indicate significance at the 1% level, 5% and 10% respectively

We also used test for the existence of long-run relationship in the presence of structural break using Gregory and Hansen (1996) test. Gregory and Hansen test is residual based cointegration test like Engle and Granger test. While Engle and Granger test does not account for structural break in ascertaining whether or not long-run relationship holds among non-stationary variables Gregory and Hansen incorporate structural break and the break is determined endogenously from the data. The need for this type of test could be linked to the possibility of structural or regime change. Gregory and Hansen (1996) argued that traditional cointegration test such as Engle and Granger test is inappropriate when regime change makes linear combination of variables shift at one unknown date in the sample. To address the above-mentioned shortcoming, Gregory and Hansen (1996) developed ADF, Za and Zt tests for cointegration in the presence of structural break.

We test for both regime shift in intercept as well as in intercept and trend. Our study findings are reported in Table 4.9. It shows that in the presence of structural break the linear combination of non-stationary variables exhibit stationary. This implies that long-run relationship holds. In addition, the result of the structural break is consistent with the conventional cointegration test reported in Table 4.4(a) and 4.4(b).

Table 4.10: Structural Break Cointegration Test – Gregory and Hansen

	Level shift	Level shift with trend
t-statistics	-4.128	-4.279
Lag	1	4
Break	2000	1991
Za-stat	-0.529	-0.529
Za-break	1984	1985
Zt-stat	-0.999	-0.999
Zt-break	1984	1985

4.7. CONCLUSION

Remittance inflows have assumed an important role as a source of foreign exchange in many developing countries, including Nigeria. The volume of remittance transfers to many developing countries has been very significant. Remittances received by Nigeria were $22 million in 1980; this increased to $56 million in 1992, from which point it started to experience consistent increases until 2004 when it was $2.4 billion. There was further phenomenal increase from $1.16 billion in 2001 to $22.97 billion in 2013 (World Bank, 2014).

An examination of exchange rates in the 1980s revealed that remittances and exchange rates were low and did not vary much. For the 1990s, both variables started experiencing gradual increases,

while the decade of the 2000s was characterised by a surge in remittances and exchange rates in Nigeria. This suggests high correlation between these two variables and an indication that as remittances increase, the exchange rate also increases. This paper conducted an empirical analysis of the effects of remittances on Nigeria's exchange rate using the ECM and data covering 1980 to 2013. This paper further explored the empirical evidence regarding the impact of remittances on the real exchange rate in Nigeria.

Our findings suggest that remittance inflows have a negative effect on the real exchange rate in the long run and the effect was found to be the same with other capital flows such as foreign direct investment and foreign portfolio investment. This implies that an increase in remittance inflows causes the real exchange rate to decrease, thereby leading to an appreciation of the domestic currency, the naira. Similarly, an increase in the other capital flows such as foreign direct investment and foreign private investment causes the real exchange rate to decline and hence contributes to the appreciation of the domestic currency. The opposite effect was found for foreign aid: an increase in foreign aid causes the real exchange rate to increase and hence contributes to the depreciation of the domestic currency.

This study highlights the relative significance of various capital inflows and how they affect the real exchange rate in Nigeria. The recent surge in the volume of remittances should elicit policy actions to ensure that the opportunities that remittances present are fully explored. It is imperative that monetary and fiscal policies in Nigeria enhance the financial infrastructure that will facilitate the seamless inflow of remittances as a veritable alternative source of capital inflow into the country. Beyond the use of remittances for domestic needs of recipient families, innovative schemes should also be instituted to unlock the economic potential of these inflows for investment in the local economy.

CHAPTER 5
EFFECTS AND TRANSMISSION CHANNELS OF REMITTANCE INFLOWS TO THE NON-TRADABLE SECTOR IN NIGERIA

Abstract

This study investigated the effect of remittances on non-tradable sectors in Nigeria. In addition, it examined the transmission channels through which remittances impact on the non-tradable sector of the economy. In the study, the non-tradable sector comprises the service sector and the trade sector. In the study, annual data ranging from 1981 to 2013 was used. An error correction model (ECM) was used to examine the long-term effect of remittances on the non-tradable sector. Furthermore, impulse response functions and variance decomposition were used to comprehend the channel through which remittances impact on non-tradable sectors of the economy. The results emanating from the study showed that an increase in remittances causes the contribution of the non-tradable sector to increase, namely the service and trade sector. Furthermore, the study found that more than fifty percent of non-tradable sectors (service and trade) are caused by remittances, thus pointing out the importance of remittances to non-tradable sectors of the economy.

Keywords: Remittances, Non-tradable, Trade, Service
JEL Classification: F40, F41, O10

5.1. INTRODUCTION

Over the last decade, remittances due to their size relative to other capital inflows have been widely discussed in the developmental arena, especially in developing countries. The attention given to remittances originates from the standpoint of its being an alternative source of developmental finance in the face of uncertainty in official development assistance. Furthermore, remittances are believed to be relatively more stable than other capital inflows (Sapkota, 2013; World Bank, 2018). Remittances are the amount of money emigrants send to their family and relatives back home. In other words, remittances are the repatriated earnings of emigrant workers to their country of origin.

The World Bank (2018) showed that in 2017 remittances to low and middle-income countries, that is developing countries, stood at $466 billion, which is three times the size of official development assistance. Remittances to SSA countries rose from $30 billion to $38 billion in 2017 (World Bank,

2018). In 2017, Nigeria was the highest recipient of remittances in Africa and ranked fifth in the world, with the amount totalling $22 billion (World Bank, 2018).

Adams and Page (2005) confirmed the developmental benefits associated with remittances in terms of poverty reduction effects in developing countries. The poverty-reducing effect of remittances occurs via its effect in rising household income as well as their consumption basket. Similarly, Sapkota (2013) provided detailed explanation to illustrate how remittances have been beneficial in reducing both poverty and inequality in Nepal, a land-locked economy and a major recipient of remittances in the world. However, Sapkota (2013) provided evidence for the existence of Dutch disease in Nepal over the last decade, a phenomenon that is associated with huge capital inflows.

Dutch disease occurs when an increase in capital inflow leads to a shift in resources from the tradable sector to the non-tradable sector of the economy (Amuedo-Dorantes & Pozo, 2004). Like other capital inflow, an increase in remittances is expected to increase the ratio of the non-tradable sector to the tradable sector. This effect occurs through the relative increase in the price of non-tradables, resulting from an increase in demand for consumption. An increase in remittances increases household income, which, in turn, leads to an increase in the demand for consumption in an economy.

From the above, this study sought to answer the following question: What is the impact of remittances on the non-tradable sectors in Nigeria? This question is important because Figures 5.1 and 5.2 do not provide convincing evidence about the relationship that exists between remittances and the service sector on the one hand and remittances and the trade sector on the other hand with respect to Dutch disease as argued in the literature.

This chapter is organised into six sections. Section two presents the stylised facts about remittances, and the performance of non-tradable (services and trade) sectors in Nigeria. Section three presents the literature review, section four provides information on the study methodology, while section five deals with the empirical results. Section six concludes the study.

5.2. REMITTANCES AND TRADABLE SECTOR PERFORMANCE IN NIGERIA: STYLISED FACTS

Figure 5.1 provides a graphical illustration of the nature of the relationship that exists between remittances and the trade sector, while that of remittances and the service sector is provided in Figure 5.2. The two charts provide preliminary information about the nature of the relationship that exists between remittances and the tradable sector in Nigeria.

Figure 5.1 shows that the contribution of the trade sector to Nigeria's GDP initially followed a declining path up until 2003. In 1981 the share of trade to GDP stood at 11.3 per cent. It increased marginally to 13 per cent in 1983 and later declined to 11.6 per cent in 1985. Thus, over the period of 1981 and 1985, the contribution of the sector to GDP was a little bit above 12 per cent. The sector recorded the least performance in 2003, as the share of the sector to GDP stood at 9.7 per cent. Since 2004, the contribution of the sector to GDP has been on the increase, with the best performance of 16.8 per cent in 2011, which is almost twice its record in 2004. When we examine the co-movement of remittances as share of GDP with that of the trade sector, we observe that between 1993 and 2003 the two variables exhibited positive co-movement but from 2004 upward, the two variables exhibited a negative relationship.

It is seen from Figure 5.2 that the contribution of service to total GDP in Nigeria over the period of 1981 to 2013 is above 24 per cent and exhibits an upward trend, except in a few instances. This suggests that the Nigerian economy is turning into a service-oriented economy. Specifically, the contribution of the service sector to GDP in 1981 stood at 24 per cent and then rose to 27.3 per cent in 1983. It then declined gradually to 24.1 per cent in 1990. The decline in the service sector between 1983 and 1990 can be associated with the economic difficulty experienced during that period. From 24.1 per cent in 1990, the share of service to GDP rose to 29.4 per cent in 2001 and then declined marginally to 26.9 per cent in 2003. Since then, the contribution of the sector has been on the increase and stood at 35.9 per cent in 2013. The direction of movement of the share of remittances to GDP and the contribution of the service sector to GDP is unclear. This will be further examined empirically in the study.

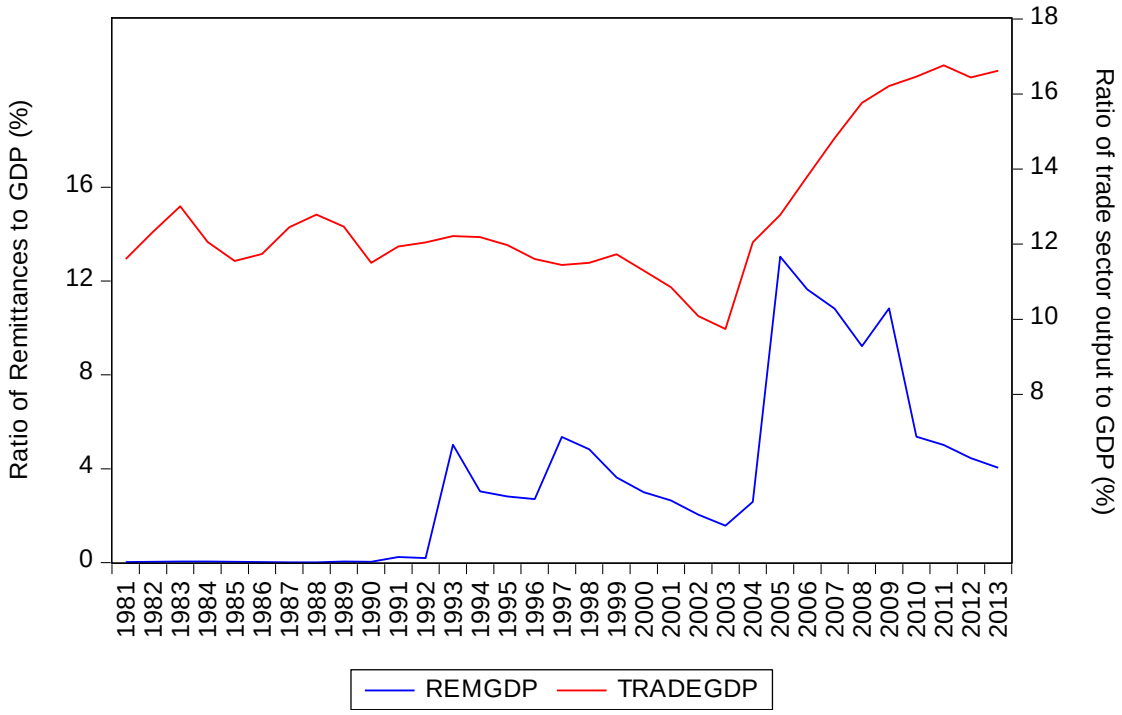


Figure 5.1: Trend: Remittance and the Performance of the Trade Sector output

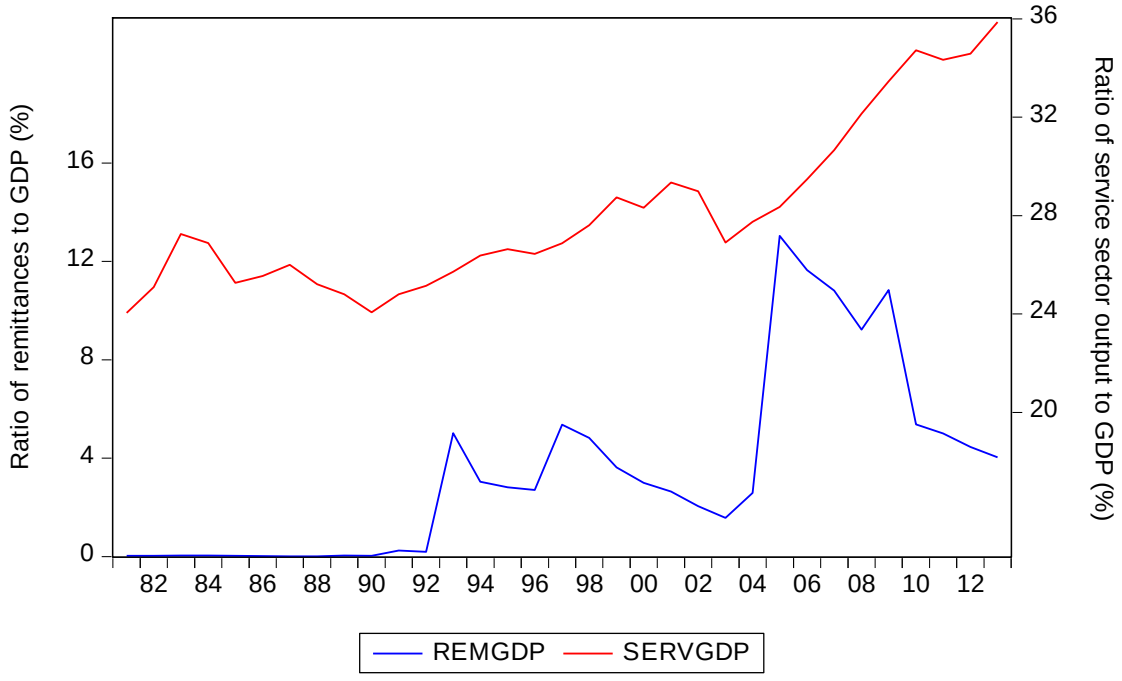


Figure 5.2: Trend: Remittances and the Performance of the Service Sector

5.3. LITERATURE REVIEW

Remittance has been subjected to different empirical analyses such as establishing Dutch disease, the impact of remittance on tradable and nontradable sectors, and establishing the channel through which

remittance will be transmitted to tradable and non-tradable sectors. Determining the effects of remittances and the transmission mechanism into non-tradable sectors is the focus of this study.

In the literature, there are two strands on the reason people send money back to the country of their origin (Singh, Haacker, Lee & Goff, 2010). The first strand of the literature argues that people remit money purposely for altruistic motives; that is, to support their family back home. The second strand argues that people remit money out of self-interest, with the goal of maximising investment opportunities that are available at home (Lucas & Stark, 1985; Adams & Page, 2005; Singh et al., 2010).

Using data for 36 African countries starting from 1990 and ending in 2008, Singh et al. (2010) examined both the determinants and the effect of an increase in remittances on economic growth. The authors employed fixed-effect two-stage least square and found that African countries' remittances are positively associated with the diaspora size of the country as well as how wealthy the location of the emigrants is. Furthermore, the authors found that the positive role of remittances on economic growth depends on the quality of domestic institutions.

Amuedo-Dorantes and Pozo (2004) investigated the effect of workers' remittances on the real exchange rate using data for 13 Latin American and Caribbean countries spanning from 1979 to 1998. An instrumental variable estimation technique was used, and they found that an increase in remittances causes the real exchange rate to appreciate.

Acosta et al. (2009) used data from El Salvador to investigate whether an increase in remittances causes Dutch disease. As a result, the authors developed and estimated a two-sector dynamic stochastic general equilibrium (DSGE) model and also used a Bayesian vector autoregressive model. The results emanating from the two estimation approaches showed that an increase in remittances causes household income to increase, which, in turn, leads to an increase in consumption demand, especially for non-tradable goods, thus implying that an increase in remittances causes Dutch disease in El Salvador. The study findings were found to be unaffected by the motive for sending money.

Bourdet and Falck (2006) examined the effect of remittances on the real exchange rate in Cape Verde and used data that start from 1980 and end in 2000. The authors employed ordinary least squares estimation techniques and found that an increase in remittances leads to an exchange rate appreciation. The authors further point out that the export-oriented policy embarked upon by the government lowers the overall effect of remittances on the real exchange rate.

Lartey, Manelman and Acoata (2012) examined the effect of remittances using disaggregated sectoral data for 109 developing countries spanning from 1990 to 2003. The authors employed the GMM estimator and found that an increase in remittances leads to both real exchange rate and resource movement from tradable sectors to non-tradable sectors of the economy. The authors measured resource movement using the ratio of tradable to non-tradable output. Tradable output is computed as the sum of the total output produced in the agricultural and manufacturing sector while the non-tradable sector is measured as the output of the service sector.

Sapkota (2013) examined whether an increase in remittances induce Dutch disease in Nepal, a land-locked economy and a major recipient of remittances in the world. The author provided a descriptive illustration of the link between remittances and real exchange rate and asserts that Dutch disease is associated with an increase in remittances into the country over the period of 2000 to 2010. On a positive note, the author showed that reduction in poverty and inequality in the country has been partly due to remittances. Furthermore, the author attributed the observed rise in poor households' expenditure capacity as well as their consumption basket to remittances.

Ito (2017) examined the effect of workers' remittances on real effective exchange rates and exports using monthly data from the Republic of Moldova over the period of 2006:1 to 2014:2. The author employed unrestricted VAR developed by Sims to capture the effect of one standard deviation in remittances on both real exchange rate and exports and found that an increase in remittances leads to real exchange rate appreciation and a decline in exports.

We now turn to studies that focused exclusively on the non-tradable sector. Nath and Vargas-Silva (2012) used monthly Mexican data from 1996:01 to 2007:06 to analyse the impact of workers' remittances on the price of 272 consumer items. The authors used Cholesky decomposition to derive the orthogonal residuals to compute the impulse response functions and variance decompositions. Their findings showed that remittances create divergent effects on the price of consumer items. More specifically, they found that an increase in remittances leads to an increase in the price of non-tradable items such as housing, electricity, and restaurants, while it has the opposite effect on consumer items such as furniture.

Guha (2013) developed a micro-macro linkage on the effect of remittance on the economy. The author extended the Dutch disease literature using households' decision as the root determinant of the effect of an increase in remittances, since households' consumption behaviour is directly influenced by remittances from the demand side analysis while remittances alter the supply of labour from the supply side analysis. Afterwards, the author used dynamic stochastic general equilibrium (DSGE) to

illustrate the transmission channels – consumption and the inter-sectoral labour channels – through which remittances affect the economy channel. The author assumed two-sectors economy, traded and non-traded. In such an economy, an increase in remittances leads to an increase in household consumption demand in both sectors, which, in turn, leads to an increase in the price of non-traded goods relative to traded goods, given the assumption that the price of traded goods responds slowly to an increase in consumption level. This causes labour movement away from the traded sector to non-traded sector, hence the output in the non-traded sector increases while the traded sector is expected to decline. In other words, an increase in remittances leads to an increase in the ratio of the non-traded sector to the traded sector as a result of the resource (labour) shift from the traded to the non-traded sector.

Lartey (2008) investigated the effect of remittances on sectoral output as well as the inflation dynamics of non-tradable goods. The author developed a model showing that in a fixed exchange rate regime, an increase in remittances leads to an increase in the demand for non-tradable goods as well as output product produced by the non-tradable sector, thereby generating non-tradable inflation. The author confirmed the above linkage using El Salvador and Philippines data by employing a VAR estimation technique.

From the above narrative, it is evident that the literature on the effect of remittances is growing. This can be attributed to attention given to remittances as an alternative source of development finance in developing countries. The Dutch disease associated with remittances has led to the debate on the potential economic cost to developing countries in terms of the adverse effect on export competitiveness via resource movement from the tradable sector to the non-tradable sector. This study thereby focused exclusively on the effect and the transmission channel of remittances to the non-tradable sector of the economy, an area sparsely addressed in the literature.

5.4. METHODOLOGY

5.4.1. Empirical Model

The empirical model to be estimated is specified as follows.

$$y_t = \beta_0 + \beta_1 remgdp_t + \beta_2 reer_t + \beta_3 m2gdp_t + \beta_4 rir_t + \beta_5 \inf l_t + \varepsilon_t \quad (1)$$

where y is the non-tradable sector (in this study service and trade are the non-tradable sector), remgdp is the share of remittances to GDP, reer is real effective exchange rate, m2gdp is the ratio of broad money to GDP, rir is real interest rate, infl is inflation rate, and ε is the residual term.

In order to capture the separate composition of the non-tradable sector, equation (1) is specified as follows

$$servgdp_t = \beta_0 + \beta_1 remgdp_t + \beta_2 reer_t + \beta_3 m2gdp_t + \beta_4 rir_t + \beta_5 \inf l_t + \varepsilon_t \quad (2a)$$

$$tradegdp_t = \beta_0 + \beta_1 remgdp_t + \beta_2 reer_t + \beta_3 m2gdp_t + \beta_4 rir_t + \beta_5 \inf l_t + \varepsilon_t \quad (2b)$$

where servgdp is the share of service sector to GDP while tradegdp is the share of trade sector to GDP.

Equation (2a) is the estimated model for the service sector while equation (2b) is the estimated model for the trade sector.

5.4.2. Estimation Procedures and Technique

The study first tested for stationarity of variables given the relatively long time series, after which a multicollinearity test was performed. These are necessary to guide against misspecification of the estimated models. The study's models were estimated using the ECM.

5.4.3. Error Correction Model

The study methodology followed the commonly established practice in time series econometrics. Thus, we first tested for the properties of the variables using unit root tests. We used three unit root tests: the Augmented Dickey-Fuller test (ADF), the Phillips-Perron test (PP) and the Kwiatkowski et al. test (KPSS). Following the unit root tests, we conducted cointegration tests to examine whether a stable long-run relationship exists amongst the variables of interest. We used the Johansen cointegration (1988) test which involves estimation in a vector error correction modelling framework. The Johansen cointegration test involves using the trace and maximum eigenvalue statistics to identify the number of cointegrating vectors of the model. Long-run relationship holds if there is at least one cointegrating equation in both trace and maximum eigenvalue test.

When a long-run relationship is established, we make use of the ECM to determine both the long-run and short-run effect of remittances and other variables on the tradable sector simultaneously. This can only be realised using this estimation procedure. Furthermore, ECM enables us to determine the speed of adjustment back to long-run equilibrium after a short-run shock.

$$\Delta y_t = \beta_0 + \beta_1 \Delta remgdp_t + \beta_2 \Delta reer_t + \beta_3 \Delta m2gdp_t + \beta_4 \Delta rir_t + \beta_5 \Delta \inf l_t + \vartheta ECT_{t-1} + \varepsilon_t \quad (3)$$

The value of $\mathcal{G}$ measures the speed of adjustment. It is expected to be negative and significant for restoration of long-run equilibrium after an exogenous shock, which ranges between 0 and 1. A value of 0 indicates no adjustment while 1 implies full adjustment one period after the time the shock occurs. In contrast, a positive value suggests that convergence to equilibrium after exogenous shock does not exist. This implies that whenever exogenous shock occurs, it leads to a permanent deviation from the equilibrium.

5.4.4. Data Source

The data for this study was sourced from the World Development Indicators (WDI) and the Annual Reports of the Central Bank of Nigeria. Summary statistics for the variables are presented in Table 5.1 below. Table 5.1 depicts the descriptive statistics for SERVGDP, TRADEGDP, REMGDP, REER, M2GDP, RIR and INFL for remittances and non-tradable sector. For the mean, median and maximum, REER records the highest value. However, the lowest value for the minimum is found in REMGDP. REER has the highest deviation from the mean with value of 129.31. The skewness in the series are very small and they all skew rightward with the exception of RIR which skews leftwards. Most of the series are leptokurtic except for SERVGDP and TRADEGDP that are platykurtic. The Jarque-Bera statistics shows that only M2GDP and RIR are normally distributed.

Table 5.1: Remittances and non-tradable sector

	SERVGDP	TRADEGDP	REMGDP	REER	M2GDP	RIR	INFL
Mean	28.105	12.784	3.467	154.901	24.447	-1.075	20.392
Median	26.904	12.064	2.707	92.146	21.963	2.072	12.877
Maximum	35.865	16.764	13.043	540.848	43.266	25.282	72.836
Minimum	24.043	9.739	0.009	49.284	13.231	-43.573	5.382
Std. Dev.	3.356	1.949	3.804	129.306	6.767	16.993	18.262
Skewness	0.967	0.941	1.125	1.622	0.733	-0.812	1.540
Kurtosis	2.838	2.779	3.313	4.639	3.273	3.540	4.080
Jarque-Bera	5.175	4.942	7.095	18.170	3.062	4.025	14.646
Probability	0.075	0.084	0.029	0.000	0.216	0.134	0.001
Observations	33	33	33	33	33	33	33

5.5. EMPIRICAL RESULTS AND DISCUSSION

5.5.1. Unit Root Test

The result of the unit root test is presented in Table 5.2. Three different unit root estimation techniques were used, namely, ADF, PP and KPSS. As earlier mentioned, the main reason for using more than

one approach is to arrive at a robust conclusion, devoid of the limitation associated with the use of a single approach. An overriding conclusion from the results reported in Table 5.2 is that in level, the variables under examination exhibit unit root. However, when the variables were first differenced, they then became stationary. Thus, all the variables used in the study were stable in their first difference. The conclusion arrived at remains valid regardless of the unit root test used. Consequently, the question arises whether these variables could be combined to make prediction in Nigeria. The possibility of this taking place devoid of spurious regression is that the variables were cointegrated.

Table 5.2: Unit Root Tests

VARIABLES		ADF	PP	KPSS
SERGDP	Level	-1.678	-1.849	0.699***
	First-Difference	-4.489***	-4.387***	0.163
TRADEGDP	Level	0.620	1.089	0.161**
	First-Difference	-3.803***	-3.808***	0.082
REMGDP	Level	-1.220	-1.185	0.544**
	First-Difference	-6.097***	-6.146***	0.147
REER	Level	-1.579	-1.545	0.367*
	First-Difference	-3.826***	-3.637***	0.120
M2GDP	Level	-3.208	-2.307	0.144*
	First-Difference	-4.070***	-6.745***	0.265***
RIR	Level	-6.047***	-6.405***	0.106
	First-Difference	-7.023***	-27.684***	0.335
INFL	Level	-2.687*	-2.598	0.243
	First-Difference	-5.172***	-8.038***	0.500**

Notes: ***, **, * indicate significance at the 1% level, 5% and 10% respectively

Source: Computed by the authors.

5.5.2. Johansen Cointegration Test

Given the nature of our data, we proceeded to co-integration analysis. In this study, as described earlier, we used Johansen co-integration technique, which is comprised of the Trace and Max-Eigen test. Since all variables are I(1), the conditions for using the Johansen cointegration test have been met. Before proceeding with the Johansen cointegration test, we performed lag length criteria due to the sensitivity of the Johansen test to lag length and the results obtained are presented in Tables 5.3(a) and 5.3(b). From the results, the optimal lag length is one, which is based on the Schwarz information criterion (SC) result. The SC result is obtained from a parsimonious model. In addition, using lag length that is more than one will reduce the study degree of freedom. Thus, we proceeded with our Johansen test using one lag.

The result of the Johansen test is presented in Table 5.4 and it shows that in both service and trade sector model, there is at least one co-integrating equation. Therefore, the existence of one co-integrating equation in both trade and service model suggests that the long-run relationship holds. Thus, we could proceed to estimate the short-run and long-run effect of remittances on the trade sector and the service sector respectively.

Table 5.3(a): Lag Length Criteria for Service Model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-531.666	NA	1.49e+08	35.844	36.125	35.934
1	-409.427	187.433*	499015.2*	30.095	32.057*	30.723*
2	-383.353	29.551	1325765	30.757	34.400	31.922
3	-333.904	36.263	1463782	29.860*	35.185	31.564

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 5.3(b): Lag Length Criteria for Trade Model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-517.598	NA	58199784	34.907	35.187	34.996
1	-408.742	166.912*	476748.6*	30.049	32.011*	30.677*
2	-369.180	44.837	515371.2	29.812*	33.455	30.977
3	-338.359	22.602	1969965.	30.157	35.482	31.861

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 5.4: Johansen Cointegration Results

	Service		Trade	
Null Hypothesis	**Trace Test Statistics**	**Maximum Eigenvalue Statistics**	**Trace Test Statistics**	**Maximum Eigenvalue Statistics**
H_0: r = 0	160.115***	65.140***	117.697***	42.626**
H_0: r ≤ 1	94.974***	42.981***	75.071**	36.036**
H_0: r ≤ 2	51.993***	26.981***	39.035	17.986
H_0: r ≤ 3	25.012***	20.561***	21.049	12.174
H_0: r ≤ 4	0.147***	4.451***	8.875	7.327

5.5.3. Long-run Estimates

The long-run effects of remittances on tradable sectors – service sector and trade sector – are presented in Table 5.5. We commenced the discussion of the results obtained from the service model. Remittances have a positive and significant effect on service sector output. The results obtained are consistent with the a priori assumptions. An increase in remittances by 100 per cent is expected to lead to an increase in service sector output by 96.9 per cent. Furthermore, an increase in real effect exchange rate leads to a decrease in service sector output. Also, it is seen from Table 5.5 that an increase in real interest rate contributes to a reduction in service sector output. Similarly, a rise in the inflation rate contributes to a decrease in service sector output.

Turning to the trade sector model, the effect of an increase in remittances on the trade sector is positive, although insignificant in the long run. Real effective exchange rate has a weak positive effect in the long run, such that an increase in real effective exchange rate by 100 per cent will contribute to an increase in trade sector output by 71 per cent. Similarly, an increase in real interest rate lowers trade sector performance. This reflects that an increase in the cost of production in terms of higher real interest rate limits the performance of the trade sector.

The diagnostic tests show that the estimated models are adequate as we could not reject the null hypothesis if the serial correlation is not at one per cent significance level. Similarly, we could not reject the null of homoscedasticity at one per cent. And also, the cumulative sum control chart (CUSUM) test showed stability of both models at five per cent significance level.

Table 5.5: Result of the Error Correction Model

Variable	Dependent Variable: SERVGDP	Dependent Variable: TRADEGDP
	Coefficient	Coefficient
REMGDP Remittance/GDP	0.969*** (0.032)	0.005 (0.097)
REER Real effective exchange rate	-1.668*** (0.074)	0.710* (0.370)
M2GDP	0.119*** (0.010)	0.124*** (0.017)
RIR Real Interest Rate	-0.090*** (0.006)	-0.029* (0.014)
INFL Inflation	-1.548*** (0.162)	0.005 (0.014)
Diagnostics		
R-Squared	0.685	0.196
Normality test	0.840	0.149
Heteroskedasticity test	0.314	0.504
Serial autocorrelation	0.741	0.066

Note: standard error in parenthesis and *, ** and *** depict significance at the 10%, 5% and 1% levels respectively

5.5.4 Short Run Estimates

The short-run effects of remittances on tradable sectors – service sector and trade sector are presented in Table 5.6. We commenced the discussion of the results with the results obtained from the service model. We found that remittances have negative and significant effect on service sector output. The results obtained is contrarily from the a priori of a positive effect. Furthermore, an increase in real effect exchange rate leads to an increase in service sector output. An increase in real interest rate contributes to reduction in service sector output. The value of the lag of the error correct term (ECT) is negative and significant, implying that in the occurrence of shock, they economy revert to its long-run equilibrium.

Turning to the trade sector model, the effect of an increase in remittances on trade sector is positive, although insignificant. An increase in changes in inflation rate has positive effect on trade sector performance. The value of the lag of the ECT is negative but insignificant, suggesting that the model will weakly reverts to long-run equilibrium value after shock to the economy.

The diagnostic tests show that the estimated models are adequate as we could not reject the null of serial correlation is not several at 1% significant level. Similarly, we could not reject the null of homoscedasticity at 1%.

Table 5.6: Short Run Results

Variable	Dependent Variable: SERVGDP		Dependent Variable: TRADEGDP	
	Coefficient	Standard Error	Coefficient	Standard Error
Short-run				
Constant	0.416***	0.146	0.126	0.121
ΔREMGDP	-0.082*	0.043	0.019	0.187
ΔREER	0.505*	0.247	-0.220	0.021
ΔM2GDP	0.100***	0.028	0.021	0.021
ΔRIR	-0.022***	0.007	0.004	0.005
ΔINFL	0.001	0.007	0.012***	0.004
ECT(-1)	-0.355**	0.154	-0.119	0.149
Diagnosis				
R-Squared	0.335		0.196	
D-W	1.548		1.283	
Normality	0.048		0.149	
Breusch-Godfrey Serial Correlation LM Test	0.259		0.066	
Heteroskedasticity test: ARCH	0.970		0.504	
CUSUM test	Stable		Stable	

Note: *, ** and *** depict significance at the 10%, 5% and 1% levels respectively

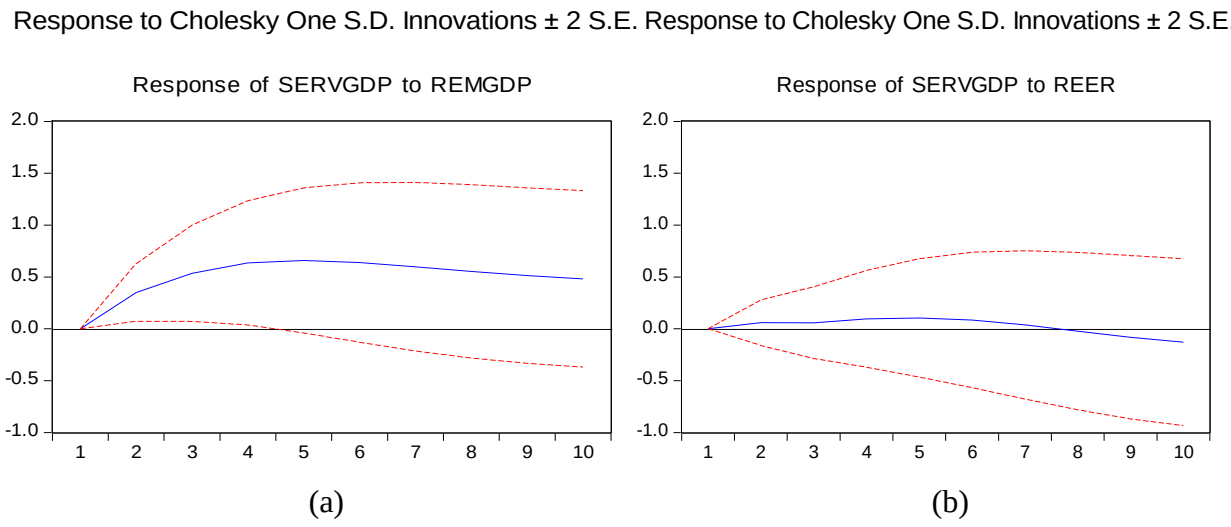
5.5.5 Transmission of Shocks to the Exchange Rate

5.5.5.1 Impulse Response

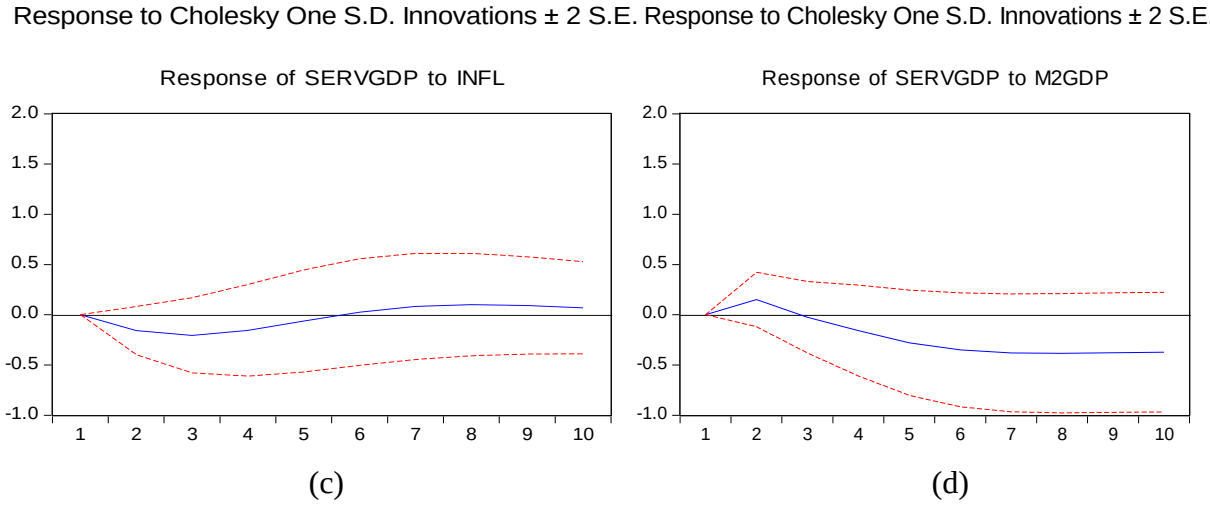
In this section, we present the results based on the impulse responses of non-tradable sectors; that is, the trade and service sectors, to one standard deviation shock to remittances as well as other explanatory variables. Figure 5.3 presents impulse response functions for the responses of the service sector to shocks in remittances and the other variables while Figure 5.4 presents that of the trade sector. Each figure traces the effect of a one-time shock to remittances and other explanatory variables on the current and future values of the service and trade sector output respectively.

Our discussion starts with the service sector. The picture that emerges from a deeper look at Figure 5.3a reveals that over the tenth horizon period, the response of the service sector to a one standard deviation in remittances is positive. The effect is higher initially but starts to decline after the first

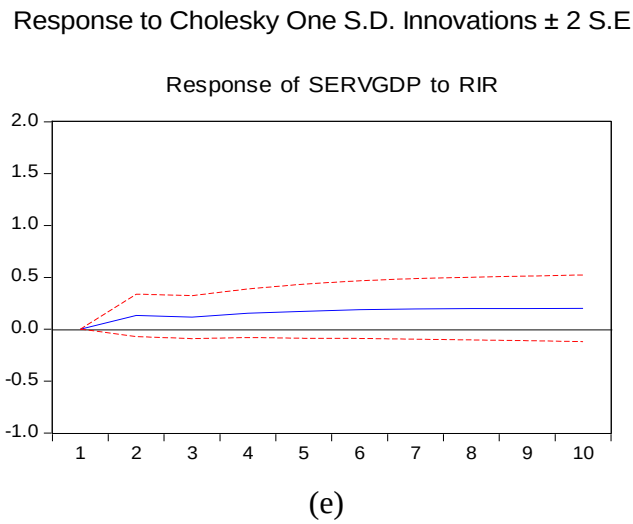
fifth horizon. Furthermore, Figure 5.3b showed that the service sector initially responds positively to the real effective exchange rate up until the seventh horizon and then turns negative. Figure 5.4c shows that the service sector initially responds negatively to the inflation rate but turns positive after the first sixth horizon.



(a) (b)



(c) (d)

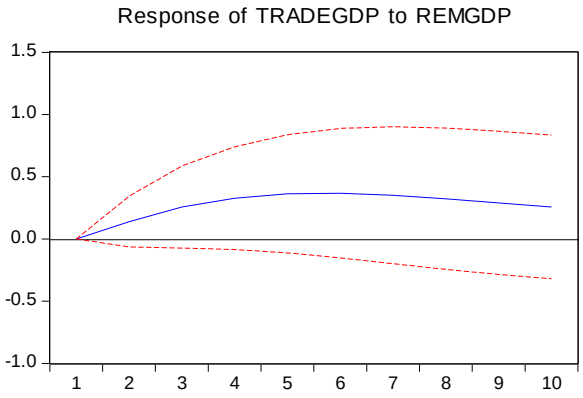


(e)

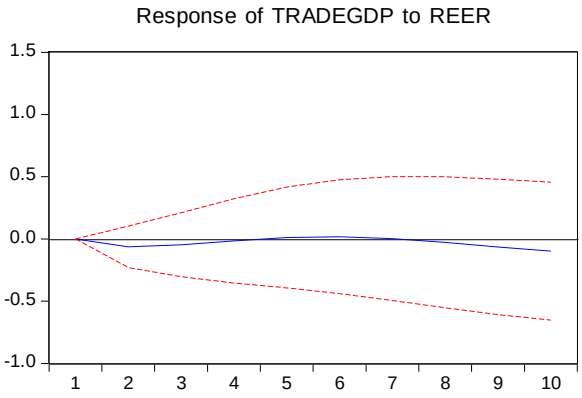
Figure 5.3: The Results of the Service Sector Impulse Response

Figure 5.4a shows that the response of the trade sector to a shock in remittances exhibits a similar pattern to what was observed for the service sector, such that the trade sector responded positively to a shock in remittances over the tenth period horizon. Furthermore, for the other macroeconomic variables, Figure 5.4b shows that the response of trade to shock in real effective ex``````````change rate in most cases was negative but very close to zero. Figure 5.4c shows that the trade sector responded negatively to a shock in inflation rate, thus exhibiting a similar pattern to the one observed under the service model.

Response to Cholesky One S.D. Innovations ± 2 S.E. Response to Cholesky One S.D. Innovations ± 2 S.E.

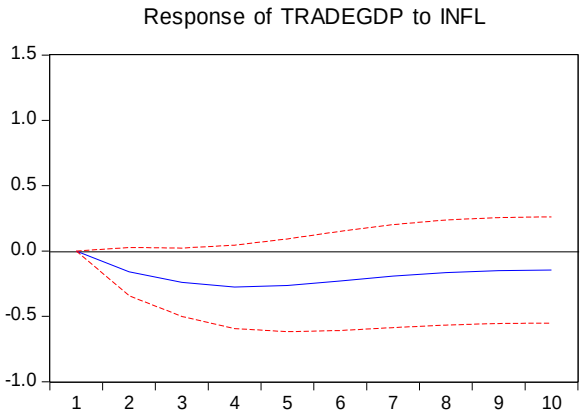


(a)



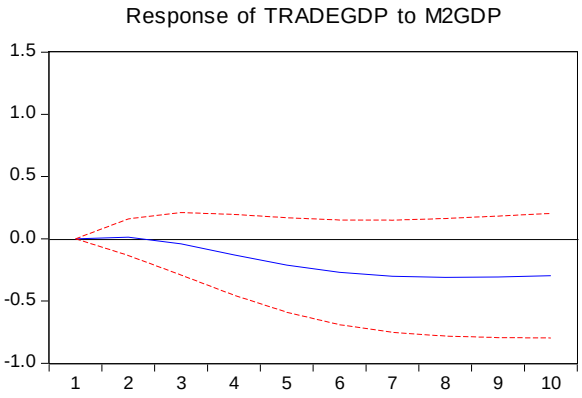
(b)

Response to Cholesky One S.D. Innovations ± 2 S.E.

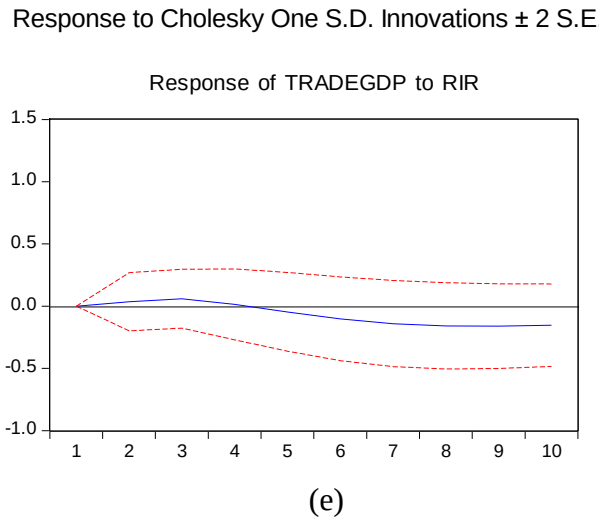


(c)

Response to Cholesky One S.D. Innovations ± 2 S.E.



(d)



(e)

Figure 5.4: The Results of the Trade Sector Impulse Response

5.5.6 Variance Decomposition Analysis

We further resorted to the use of variance decomposition to estimate the proportion to the variation in the non-tradable sector that is explained by remittances. The result of the service sector is reported in Table 5.7 while that of the trade sector is reported in Table 5.8. As shown in Table 5.7, the share of remittances in the service sector forecast error rose from 5.605 per cent in the 2nd period to 16.749 per cent in the fifth period and then increased further to 27.526 per cent in the tenth period. Remittances represent more than fifty of none-own forecast error.

Table 5.7: The Result of the Variance Decomposition – Service Sector

Period	SERVGDP	REMGDP	REER	M2GDP	INFL	RIR
1	100.000	0.000	0.000	0.000	0.000	0.000
2	82.847	5.605	6.211	5.037	0.183	0.118
3	74.862	7.722	13.615	3.175	0.508	0.117
4	67.752	12.481	16.499	2.158	1.032	0.079
5	63.020	16.749	15.959	2.351	1.162	0.053
6	57.899	21.616	15.827	3.224	1.264	0.038
7	54.406	24.188	15.718	4.266	1.284	0.030
8	51.975	25.915	15.955	5.071	1.296	0.026
9	50.325	26.794	16.207	5.605	1.298	0.022
10	49.129	27.526	16.373	5.800	1.319	0.020

A similar pattern was observed for the Trade model as presented in Table 5.8. The contribution of remittances to the trade sector forecast error in the second period was 2.33 per cent and then increased to 13.98 per cent by the fifth period and by the tenth period it rose to 17.28 per cent. At the end of the tenth period, the trade sector contributed 61.473 per cent of its own forecast error while close to fifty

of the other errors arose from remittances. This reflects the importance of remittances to the non-tradable sector of the Nigerian economy.

Table 5.8: The Result of the Variance Decomposition – Trade Sector

Period	TRADEGDP	REMGDP	REER	INFL	M2GDP	RIR
1	100.000	0.000	0.000	0.000	0.000	0.000
2	93.990	2.330	0.490	3.051	0.018	0.121
3	85.937	6.618	0.488	6.601	0.277	0.079
4	78.708	10.741	0.365	8.456	1.658	0.071
5	73.020	13.890	0.286	8.616	4.081	0.107
6	68.834	15.884	0.242	7.938	6.940	0.163
7	65.909	16.947	0.203	7.089	9.632	0.220
8	63.913	17.382	0.196	6.357	11.881	0.271
9	62.521	17.437	0.269	5.802	13.658	0.314
10	61.473	17.280	0.446	5.403	15.048	0.351

5.6. ROBUSTNESS TESTS

Given the drawback of traditional unit root in the presence of structural break (Perron, 1989). In this study, we deployed structural break unit root test and cointegration test. Since unit root and structural breaks are related, the use of unit root test that does not account for structural breaks such as ADF, PP and KPSS might leads to false inference. Perron (1989) then stressed that non-stationarity of macroeconomic data can be attributed to structural changes in the economy, and as such the traditional unit root test are biased towards false unit root when the data are trend stationary with structural break. Hence, by including structural break date to the unit root equation ensure that the bias is eliminated. Perron (1989) developed the first unit root test with structural break date. Under this approach, the break date is determined exogenously. However, subsequent approaches by Zivot and Andrews, 1992; Banerjee et al 1992; and Perron, 1997 innovate and incorporate endogenously determined single break date from the data.

In this study, Perron (1997) structural break unit root test is used. This test include the time trend and the time at which structural change occurs. The results obtained are reported in Table 5.9. It shows that in first difference all the variables are stationary. Our finding here is consistent with the results obtained under the traditional unit root test as reported in Table 5.2.

Table 5.9: Structural Break Unit Root Test – Perron (1997)

Variable	Intercept only		Both intercept and trend	
	t-statistics	Break point	t-statistics	Break point
	Level			
SERGDP	-2.844	2008	-3.906	2001
TRADEGDP	-4.439	2003	-6.117***	2002
REMGDP	-6.220***	2004	-4.035	1998
REER	-4.366	1998	-3.319	1993
M2GDP	-4.685*	2006	-5.309**	1998
RIR	-7.059***	1995	-6.923***	1995
INFL	-4.171	1999	-4.850	1998
	First difference			
SERGDP	-5.742***	2003	-6.208***	2002
TRADEGDP	-6.113***	2003	-7.463***	2003
REMGDP	-6.578***	2007	-6.781***	2003
REER	-5.045**	1999	-13.015***	1998
M2GDP	-6.210***	2005	-6.118***	2004
RIR	-7.525***	2010	-7.891***	2009
INFL	-7.085***	1995	-9.270***	1995

Note: *,**, and *** denote statistical significant at 10%, 5% and 1% respectively.

We also used test for the existence of long-run relationship in the presence of structural break using Gregory and Hansen (1996) test. Gregory and Hansen test is a residual based cointegration test like Engle and Granger test. While Engle and Granger test does not account for structural break in ascertaining whether or not long-run relationship holds among non-stationary variables, Gregory and Hansen incorporate structural break and the break date is determined endogenously from the data. The usefulness of this type of test could be linked to the possibility of structural or regime change. Gregory and Hansen (1996) argued that traditional cointegration test such as Engle and Granger test is inappropriate when regime change makes linear combination of variables shift at one unknown date in the sample. To address the above mentioned shortcoming, Gregory and Hansen (1996) developed ADF, Za and Zt tests in the presence of structural break.

We test for both regime shift in intercept as well as in intercept and trend. Our study findings are reported in Table 5.10. It shows that in the presence of structural break, while the variables are non-stationary, linear combination of the variables exhibit stationary. This implies that long-run relationship holds. In addition, the results of the structural break co-integration test is consistent with the conventional cointegration test results reported in Table 5.4.

Table 5.10: Structural Break Cointegration Test – Gregory and Hansen Test

	Service sector		Trade sector	
	Level shift	Level shift with trend	Level shift	Level shift with trend
t-statistics	-3.781	-4.933	-4.833	-4.955
Lag	0	1	1	0
Break	2007	2006	2005	2006
Za-stat	0.441	0.441	0.375	0.375
Za-break	1984	1984	1984	1984
Zt-stat	2.146	2.146	1.00	1.000
Zt-break	1984	1984	1984	1984

5.7. CONCLUSION

This study investigated the effect and the transmission channels of remittances to the non-tradable sector in Nigeria using annual data that start from 1981 and end in 2013. The non-tradable sector in the study was examined using the service and trade sectors. The study employed an ECM to quantify the effect of remittances on the non-tradable sector – service and trade sectors. Furthermore, impulse response functions and variance decomposition were computed from the Cholesky approach from a VAR estimated to understand the transmission channel.

The findings emanating from the study's ECM suggest that remittances have a positive effect on both the service sector and the trade sector, which constitute the non-tradable sector. As found in the study, remittance inflows lead to an increase in the service sector contribution to total GDP.

Furthermore, the results emanating from the impulse response and variance decomposition provide insight into the link between remittances and the non-tradable sector in Nigeria. Specifically, remittances constitute more than fifty percent of non-own forecast error in both service and trade models. In addition, both trade and service sector responded positively to a shock in remittances over the tenth period horizon, thus suggesting that remittances influence the non-tradable sector in Nigeria.

CHAPTER 6
EFFECTS AND TRANSMISSION CHANNELS OF REMITTANCES ON TRADABLE SECTORS IN NIGERIA

Abstract

The inflows of remittances affect the exchange rate of Nigeria. Since the price of tradable goods is determined by the exchange rate, the channel through which remittances influence the tradable sector of an economy is the exchange rate. Thus, this study examined the transmission channel of the effect of remittances on the tradable sector in Nigeria using annual time series data from 1981 to 2016. The ECM was employed and the findings show that remittances have a positive effect on the tradable sector despite a negative relationship between exchange rate and the tradable sector. This, therefore, suggests that the Dutch disease phenomenon does not hold in Nigeria with regard to exchange rate and the competitiveness of the tradable sector.

Keywords: *Nigeria, ECM, Dutch Disease, Tradable Sector*

6.1. INTRODUCTION

Remittances as household income resulting from international migration of workers are emerging as an important source of external development finance (Kapur, 2003). They are growing both in absolute terms and relative to other sources of external finance. Remittances are more stable than other sources of external finance and are providing social insurance in many countries afflicted by economic and political crises. However, just as with all substantial external flows, the effect of remittances is complex (Kapur, 2003). There is a body of research that documents that remittance inflows enable the migrants to share in the risk of family members at home and it is also an avenue for informal credit and altruistic arrangements. Remittances may be used to acquire assets such as housing, land, financial assets and businesses in the community of origin (Osili, 2004). However, very little is known about any specific investments that migrants make in Nigeria (Osili, 2004).

Unlike capital flow, remittances do not entail the creation of external debt with future repayment obligations. They do not come with a variety of political and economic conditions that the recipient country must comply with in the case of the foreign development assistance. In spite of these virtues, large inflows of remittance can, however, pose macroeconomic challenges for the recipient countries (Barajas, 2011). For instance, larger inflows of remittances could lead to the emergence of Dutch disease. This means that remittance inflows could result in an appreciation of the equilibrium real

exchange rate that would tend to undermine international competitiveness of domestic production, particularly the tradable sector of the economy.

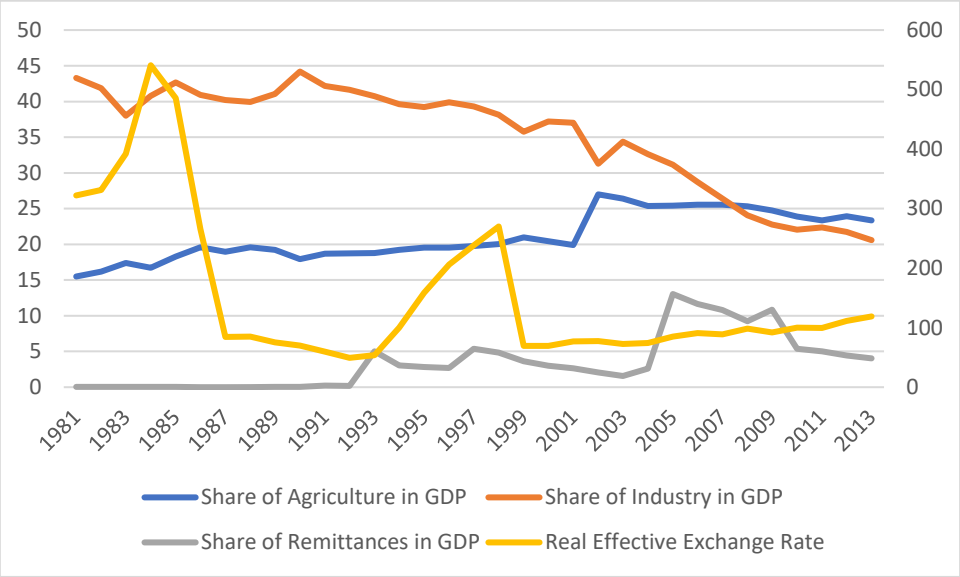
In the case of Nigeria, remittance inflows have always been on the increase and the country receives the largest inflows in sub-Saharan Africa (SSA). In 2004, it was reported that Nigeria received nearly 65 per cent of officially recorded remittance flows to the region and two per cent of the global flows. The country recorded US$20.7 billion in 2015 (World Bank, 2016). In this present study, the economy is broadly classified into tradable and non-tradable sectors. The focus of this study is to look at the transmission channel and the effects of remittances on the tradable sectors. The tradable sectors are sub-divided into industrial and agricultural sectors. This study is organised into six sections. Following the introductory section, section two presents the stylised facts about remittances and the sub-sectors of the tradable sector. Section three is the literature review while section four focuses on the methodology. Section five is the empirical analysis and section six concludes the study.

6.2. REMITTANCE, EXCHANGE RATE AND SECTORAL PERFORMANCE IN NIGERIA: STYLISED FACTS

Table 6.1 represents the trend of remittances, exchange rate, agricultural output and industrial output. All are expressed as a ratio of GDP. Starting with the contribution of agricultural and industrial outputs to GDP, it will be observed that the industrial sector contributes more to GDP than the agricultural sector in the earlier part of the trend. Between 1981 and 2013, agriculture contributed 20.0 per cent to GDP while the share of industry was 35.20 per cent. Even though the share of industry outnumbers that of agriculture, agriculture catches up in the later part of the period, 2008, with a value of 25.30 per cent, while industry records 24.05 per cent.

Regarding remittances and exchange rate, it will be observed that both variables have not been stable, as they are characterised by up and down swings. Moreover, there is no clear relationship between exchange rate and remittances. This is because some of the periods of appreciation and deprecation of real effective exchange rate are not associated with periods of decline in tradable sectors (agricultural and industrial sector). Therefore, the relation between the movement of remittances and real effective exchange rate does not explain the phenomenon of Dutch disease, which describes the channel through which the remittance can affect the tradable sector of an economy.

Figure 6.1: Remittances, Real Effective Exchange Rate and Sectoral Performance in Nigeria



6.3. LITERATURE REVIEW

Even though several studies have been carried out on the role of remittances in an economy, little can be found about the sectoral impact of remittance inflows in a country. There are various channels through which remittances can influence the economy. The first channel is through spending effect. Remittances can fuel inflation in the recipient economy because of an increase in local demand for goods and services. The second channel is reduction in the labour market participation rate. This is because households in the recipient country can choose not to work and depend on migrants' transfers. This moral hazard permits the migrant's family members to reduce their work effort (Chami, Fullenkamp & Jahjah, 2005). The increase in consumption demand as a result of the first two channels leads to a rise in the price of non-tradables. The higher non-tradable price leads to the expansion of that sector, resulting in the reallocation of labour away from the tradable sector (Acosta et al., 2009). The third channel has to do with the possibility that countries can face a situation where the inflows of remittances cause a real appreciation of the exchange rate. This has a negative effect on the tradable sector of the economy by restricting export performance and hence possibly limiting output and employment (Catrinescu, Leon-Ledesma, Piracha & Quillin, 2009). Therefore, the three channels all show that remittance inflows have a negative effect on the tradable sector and this can be tested empirically.

Some of the empirical studies relating to this study include Amuedo-Dorantes and Pozo (2004), who tested the impact of workers' remittances on the real exchange rate using a panel of 13 Latin American and Caribbean countries. The analysis revealed that workers' remittances have the potential to inflict

economic costs on the export sector of receiving countries by reducing their international competitiveness. This raises concerns similar to the Dutch disease, where resource discovery results in the appreciation of the real exchange rate and shifting of resources from the tradable sectors to non-tradable sectors in the economy. Ball et al. (2008) used a theoretical model and panel vector autoregression technique to examine the effect of remittances on GDP, inflation, real exchange rate and money supply, depending on the exchange rate regimes. The study allows a more detailed description of the short-run dynamics as it considers both yearly and quarterly data for 21 emerging countries. The model predicts that remittances temporarily increase inflation, GDP, the domestic money supply and appreciation of the real exchange rate under a fixed regime but temporarily decrease inflation, increase GDP, appreciate the real exchange rate and generate no change in the money supply under a flexible regime. This adds to the understanding of the true effect of remittances on tradable sectors by showing that exchange rate regimes matter for the effects of remittances on the performance of the economy.

In addition, Lartey (2008) examined the nexus between remittances, exchange rate and Dutch disease, using disaggregated sectoral data. The study shows that rising levels of remittances have spending effects that lead to real exchange rate appreciation and resource movement effects that are biased towards the non-tradable sectors at the expense of tradable goods production. This also shows two aspects of the Dutch disease phenomenon. It is further indicated in the study that these effects are stronger under fixed nominal exchange rate regimes. Mandelman (2013), using data for the Philippines, developed and estimated a heterogeneous agent model to analyse the role of monetary policy in a small open economy subject to sizable remittance fluctuations. The study included rule of thumb households with no access to financial markets and tested whether remittances are countercyclical and serve as an insurance mechanism against macroeconomic shocks. It was found that in a purely deterministic framework, a nominal fixed exchange rate regime avoids a rapid real appreciation and performs better for recipient households facing an increasing trend for remittances. However, a flexible floating regime is preferred when unanticipated shocks driving the business cycle are a fundamental aspect of the economy.

Furthermore, Acosta et al. (2008) investigated the impact of international remittances on poverty and inequality in ten Latin American countries, using a household survey-based estimate. It was found that remittances in those countries have reduced inequality and poverty. However, the study confirms that the reduction in poverty that is brought about by the inflows of remittance has led to withdrawal of labour supply by the households in those countries. This creates moral hazard, which affects the tradable sector. Acosta et al. (2009), while using data for El Salvador and Bayesian techniques,

developed and estimated a two-sector dynamic stochastic general equilibrium model to analyse the effects of remittances in emerging market economies. The study found that altruistically motivated remittance flows lead to a decline in labour supply and an increase in consumption demand that is biased towards non-tradable sectors. However, Adams (2007) examined the economic impact of international remittances on countries and households in the developing world using a new data set of 115 developing countries, showing that at the household level, households receiving remittances spend less on consumption goods and more on investment goods, which promotes the activities of the tradable sectors. This study confirms that remittances do not necessarily have a negative effect on the tradable sectors as households receiving international remittances also tend to invest more in entrepreneurial activities.

Finally, even though most studies argue that remittances have a negative effect on the tradable sectors via appreciation of real exchange rate and reduction in workers' effort, there is a study that shows a positive effect of remittances on the tradable sectors. Therefore, the impact of remittance inflows on the tradable sector depends the use of remittance inflows.

6.4. METHODOLOGY

As reviewed in the literature, there are various channels through which remittances can affect the tradable sectors. One such channel is the real appreciation of the exchange rate, which makes the recipient country's export less competitive and leads to the decline in the tradable sectors. The tradable sectors are classified into manufacturing and agricultural sub-sectors in this study. To analyse the transmission channel and the effect of remittances on each sub-sector of the tradable sector, this study follows the work of Chami et al. (2005). From the theoretical model of Chami et al. (2005), the empirical models for the two sub-sectors can be specified as follows:

$$AGRIGDP = f(REMGDP, REER, M2GDP, RIR, INFL) \quad (1)$$

$$INDGDP = f(REMGDP, REER, M2GDP, RIR, INFL) \quad (2)$$

Where AGRIGDP = Share of agricultural output in GDP

REMGDP = Share of remittances in GDP

REER = Real effective exchange rate

M2GDP = Ratio of broad money to GDP

RIR = Real interest rate

INFL = Inflation rate

INDGDP = Share of industrial output in GDP

This analysis is based on time series annual data from 1981 to 2013. The data source includes the Central Bank of Nigeria Statistical Bulletin and WDI. To estimate equation (1) and (2), the natural log of the real effective exchange rate is taken and this results in the following equation (3) and (4)

$$AGRIGDP = \beta_0 + \beta_1 REMGDP + \beta_2 \ln REER + \beta_3 M2GDP + \beta_4 RIR + \beta_5 INFL + \mu_0 \quad (3)$$

A priori expectation:

REMGDP < 0, lnREER <0, M2GDP >0, RIR < 0 and INFL < 0

$$INDGDP = \beta_0 + \beta_1 REMGDP + \beta_2 \ln REER + \beta_3 M2GDP + \beta_4 RIR + \beta_5 INFL + \mu_0 \quad (4)$$

REMGDP < 0, lnREER <0, M2GDP >0, RIR < 0 and INFL < 0

β_0, β_1, β_2, β_3, β_4 and β_5 are the parameters.

6.4.1. Estimation Technique

The study first tests for stationarity of series after which the models are estimated using an ECM.

6.4.1.1. Error Correction Model (ECM)

This study used an ECM. To carry out the estimation technique, we first test for the stationarity properties of the series. The ADF, PP and the KPSS are employed. Having tested for the stationarity, we proceed to the test of cointegration to see if there is a long-run relationship among the series. The Johansen test of cointegration is adopted. The Johansen test uses both the trace value and maximum eigenvalue as the test statistics to establish the number of cointegrating equations that exist in the models. Then we estimate the ECM to determine both the short-run and long-run effects of remittances on the sub-sectors of tradable sector in Nigeria. The ECM models for the two sub-sectors can be specified as follows:

$$\Delta AGRIGDP_t = \beta_0 + \beta_1 \Delta REMGDP_t + \beta_2 \ln \Delta REER_t + \beta_3 \Delta M2GDP_t + \beta_4 \Delta RIR_t + \beta_5 \Delta INFL_t + \beta_6 ECT_{t-1} + \mu_0 \quad (5)$$

$$\Delta INDGDP_t = \beta_0 + \beta_1 \Delta REMGDP_t + \beta_2 \ln \Delta REER_t + \beta_3 \Delta M2GDP_t + \beta_4 \Delta RIR_t + \beta_5 \Delta INFL_t + \beta_6 ECT_{t-1} + \mu_0 \quad (6)$$

The value β_6 which is the coefficient of ECT in the above models must be significant and negative. It measures the speed of adjustment to long-run equilibrium after an exogenous shock. Its value ranges

from 0 to 1. A 0 value indicates no adjustment while a value of one shows full adjustment one period after the shock occurs.

6.4.1.2. Test of Cointegration

After performing the unit root test, a series can be classified as integrated of order I(0), I(1), etc. When variables have a different order of integration in the model, it is possible to have a linear combination of these variables that will lead to a stationary relation among the series where standard inference is possible. This process of establishing stationarity among non-stationary variables is called cointegration. A cointegration test is a necessary step to check whether a model has empirically meaningful relationships.

The tests of cointegration include the Engle and Granger's two-step procedure and Johansen test of cointegration. The foremost test of cointegration was formulated by Engle and Granger (1987), and is intuitive and easy to perform. To estimate the Engel and Granger cointegration, we first estimate the cointegration regression where all variables must be of the same order of integration. If the variables are cointegrated, they will share a common trend and form a stationary relationship in the long run. Thereafter, a unit root test is performed on the residual of the cointegrating regression. An ADF test can be performed under the null hypothesis of no cointegration. This test has three fundamental problems. First, the use of the ADF test in the second step makes all the problems associated with the ADF test to be valid for the test. Second, the test is based on the assumption of one cointegrating vector captured by the cointegrating regression. Thus, care must be taken when applying the test to models with more than two variables. Third, the test assumes a common factor in dynamics of the system.

The Johansen's test of cointegration is the superior test as it has all the desirable statistical properties. The only weakness of the test is that it relies on the asymptotic properties and is therefore sensitive to specification errors in limited samples. The empirical VAR is formulated with lags and dummy variables so that the residuals become a white noise process. The demand for a well specified model is higher than the autoregressive integrated moving average (ARIMA) model. The model must be integrated of order one and if there are signs of I(2) variables, it has to be transformed to I(1) before setting up the VAR. The number of cointegrating equations is identical to the number of stationary relationships in the matrix. The two main tests of Johansen's test are the trace test and the max eigenvalue test with the null hypothesis that there exist r cointegrating vector against the alternative of r+1 vector. Conclusion can now be made on the number of cointegrating equations once the basic tests have been performed.

6.5. EMPIRICAL ANALYSIS

6.5.1. Unit Root Test and Test of Cointegration

Descriptive statistics for the variables are presented in Table 6.2. REER has the highest mean, median and maximum value. For most of the series, the mean and median values are very close with the exemption of REER. The degree of the deviation from the mean which is captured by the standard deviation show that REER records the highest value while AGRICGD accounts for the lowest value. Most of the series are positively skewed with the exemption of INDGDP and RIR which skew negatively. Most of the series are leptokurtic apart from AGRIGDP and INDGDP which are leptokurtic. The Jarque-Bera results show that most of the series are normally distributed with exemption of REMGDP, REER and INFL which are not.

Table 6.2: Remittances and tradable sector

	AGRIGDP	INDGDP	REMGDP	REER	M2GDP	RIR	INFL
Mean	21.052	35.203	3.467	154.901	24.447	-1.075	20.392
Median	19.761	38.131	2.707	92.146	21.963	2.072	12.877
Maximum	26.995	44.192	13.043	540.848	43.266	25.282	72.836
Minimum	15.496	20.586	0.009	49.284	13.231	-43.573	5.382
Std. Dev.	3.282	7.460	3.804	129.306	6.767	16.993	18.262
Skewness	0.321	-0.798	1.125	1.622	0.733	-0.812	1.540
Kurtosis	1.840	2.185	3.313	4.639	3.273	3.540	4.080
Jarque-Bera	2.417	4.419	7.095	18.170	3.062	4.025	14.646
Probability	0.299	0.110	0.029	0.000	0.216	0.134	0.001
Observations	33	33	33	33	33	33	33

Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) are used to test for the unit root. The results of the tests show that six out of the eight variables used in the models are integration of order one I(1) while INFL and RIR are both I(0) and the results are presented in Table 6.3. Given that most of the series in the remittance functions are stationary at first difference, the Johansen and Juselius test of cointegration is performed in Table 6.4 to show that the series has a long-run relationship. Both the max eigenvalue and trace statistics for the two equations indicate that the series is cointegrated. For instance, both the trace statistics and max eigenvalue show that there is one cointegrating equation for the two models.

Table 6.3: Results of the Unit Root Test

VARIABLES		ADF	PP	KPSS
AGRIGDP	Level	-1.764	-1.734	0.659**
	First-Difference	-6.197***	-6.211***	0.106
INDGDP	Level	-1.570	-1.321	0.192**
	First-Difference	-6.360***	-6.360***	0.287
REMGDP	Level	-1.220	-1.185	0.544**
	First-Difference	-6.097***	-6.146***	0.147
REER	Level	-1.579	-1.545	0.367*
	First-Difference	-3.826***	-3.637***	0.120
M2GDP	Level	-3.208	-2.307	0.144*
	First-Difference	-4.070***	-6.745***	0.265***
RIR	Level	-6.047***	-6.405***	0.106
	First-Difference	-7.023***	-27.684***	0.335
INFL	Level	-2.687*	-2.598	0.243
	First-Difference	-5.172***	-8.038***	0.500**

Table 6.4: Johansen Co-integration Results

	Agriculture		Industry	
Null Hypothesis	**Trace Test Statistics**	**Maximum Eigenvalue Statistics**	**Trace Test Statistics**	**Maximum Eigenvalue Statistics**
H_0: r = 0	114.766***	41.541**	104.858**	41.632**
H_0: r ≤ 1	73.224**	30.918	63.227	25.495
H_0: r ≤ 2	42.306	20.546	37.732	15.730
H_0: r ≤ 3	21.761	14.228	22.002	15.400
H_0: r ≤ 4	7.533	5.821	6.602	6.234
H_0: r ≤ 5	1.712	1.712	0.368	0.368

6.5.2. Short-run and Long-run Results

The short-run and long-run effects of remittances on tradable sectors – agricultural and industrial sectors – are presented in Table 6.5. We commenced the discussion of the results with the results obtained from the agricultural model. From the agricultural sector model, we found that in the short run and long run, an increase in remittances causes agricultural sector output to increase, and the effect is found to be significant at the five per cent statistical level. In addition, an increase in real effective exchange rate leads to a decline in agricultural sector output. In the long run, an increase in the level of inflation results in a decrease in agricultural output. The value of the lag of the error correction term (ECT) is negative and significant, suggesting that in the event of a shock, the economy reverts to its long-run equilibrium.

We turned to the discussion of the results obtained under the industrial sector model, which is also presented in Table 6.5. We found that remittances have a positive effect on industrial output both in the short run and the long run; however, the effect is insignificant. An increase in real effective exchange rate has a negative short-run and long-run effect on industrial output. Thus, when domestic currency depreciates, it has an adverse effect on industrial output. Furthermore, an increase in real interest rate leads to an increase in industrial output, while a rise in the ratio of broad money to GDP contributes to a reduction in industrial sector output. The value of the lag of the ECT is negative and significant. The implication of the negative sign of ECT is that in the occurrence of shock, the economy reverts to its long-run equilibrium.

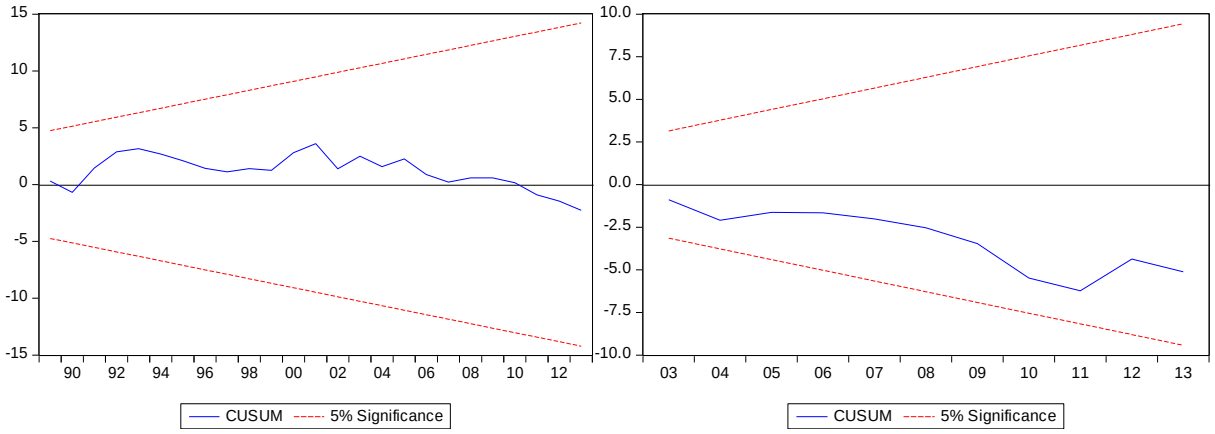
The diagnostic tests show that the estimated models are adequate as we could not reject the null of serial correlation which is not several at one per cent significance level. Similarly, we could not reject the null of homoscedasticity at one per cent. Also, the CUSUM test showed stability of both models at five per cent significance level.

Table 6.5: Long-run and Short-run Estimate of the ECM Model

Variable	**AGRIGDP Coefficient**	**INDGDP Coefficient**
Constant	0.015 (0.120)	-0.778** (0.298)
ΔREMGDP Remittance as a share of GDP	0.051** (0.024)	0.013 (0.040)
ΔREER Real Effective Exchange Rate	-0.243 (0.366)	-0.522 (0.457)
ΔM2GDP Broad Money as a share of GDP	0.010 (0.020)	-0.187*** (0.046)
ΔRIR Real Interest Rate	-0.004 (0.005)	0.050*** (0.016)
ΔINFL Inflation	0.002 (0.009)	-0.006 (0.016)
ECT(-1)	-0.152*** (0.047)	-0.356** (0.165)
Constant	29.779*** (3.309)	65.772*** (4.399)
REMGDP Remittance as a share of GDP	0.473*** (0.110)	0.103 (0.151)
REER	-1.711**	-2.064***

Variable	AGRIGDP Coefficient	INDGDP Coefficient
Real Effective Exchange Rate	(0.631)	(0.703)
M2GDP	-0.048 (0.060)	-0.316*** (0.062)
RIR Real Interest Rate	-0.010 0.025)	0.081*** (0.026)
INFL Inflation	-0.050* (0.024)	0.029 (0.026)
Diagnostics		
R-Squared	0.770	0.420
D-W	1.873	2.096
Normality	0.380	0.950
Breusch-Godfrey Serial Correlation LM Test	0.903	0.653
Heteroskedasticity test: ARCH	0.111	0.132
CUSUM test	Stable	Stable

Note: standard error in parenthesis and *, ** and *** depict significance at the 10%, 5% and 1% levels respectively



(a) Agriculture (b) Industry

Figure 6.1: Result of the CUSUM Test

6.5.3. Transmission of Shock to Non-tradable Sector

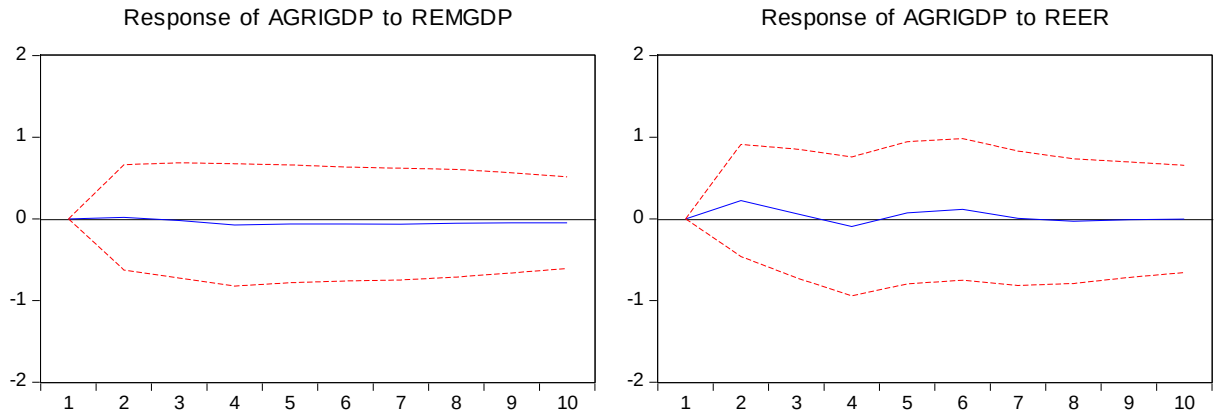
6.5.3.1. Impulse Response

The results of the impulse response of tradable sectors, which in this study are the agricultural and industrial sectors, to a one standard deviation shock to remittances and other explanatory variables are next presented. Specifically, the impulse response functions for the responses of the agricultural sector to shocks in remittances and other variables are presented in Figure 6.2 while those of the industrial sector are presented in Figure 6.3. The figures provide information with respect to the effect of a one-time shock to remittances and other explanatory variables on the current and future values of the agricultural and industrial sectors respectively.

We commence our discussion with the agricultural sector. From Figure 6.2a it is seen that over the tenth horizon period, the agricultural sector responded negatively to a one standard deviation in remittances, although the response is very close to zero. In addition, from Figure 6.2b it is seen that the agricultural sector initially responded positively to a shock in real effective exchange rate and then responded negatively in the fourth period. The sector responded positively from the fifth period upward. Furthermore, Figure 6.2c shows that the response of the agricultural sector to a shock in inflation rate is negative, although the magnitude reduces with time.

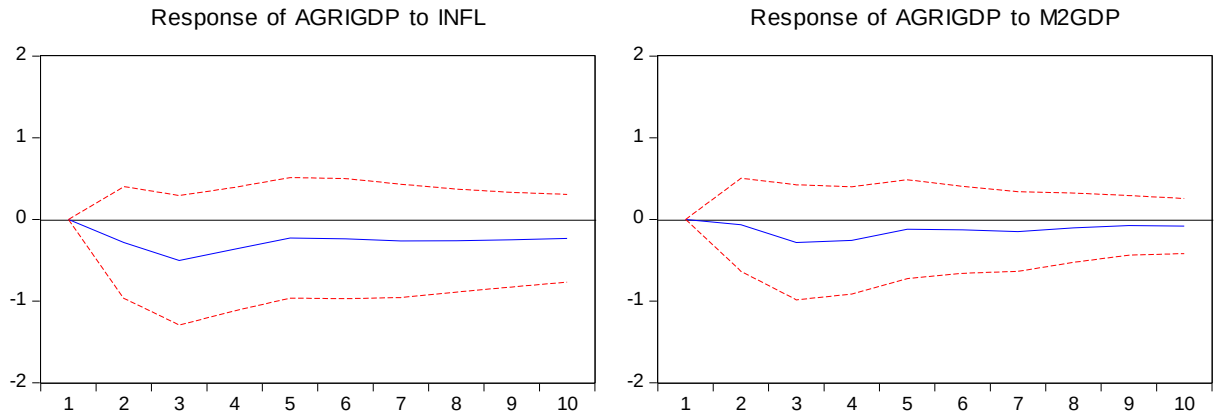
Focusing on Figure 6.3, it is seen from Figure 6.3a that the industrial sector negatively responds to a one standard deviation in remittances over the tenth horizon period. Initially the effect is high, but then starts to decline after the first third horizons. Furthermore, Figure 6.3c shows that the industrial sector initially responded positively to a one standard deviation in real effective exchange rate. The sector responded negatively in the third horizon up until the eighth horizon when the sector response turned positive. The industrial sector responded to a one standard deviation in inflation rate. Figure 6.3c shows that the response of the sector for the first fifth horizons was positive but then turned negative afterward.

Response to Cholesky One S.D. Innovations ± 2 S.E.Response to Cholesky One S.D. Innovations ± 2 S.E.



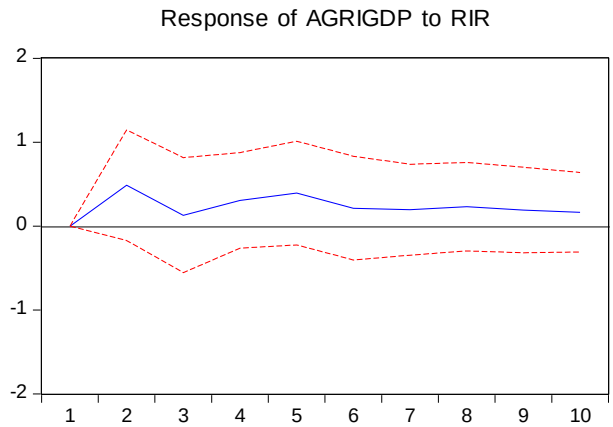
(a) (b)

Response to Cholesky One S.D. Innovations ± 2 S.E.Response to Cholesky One S.D. Innovations ± 2 S.E.



(c) (d)

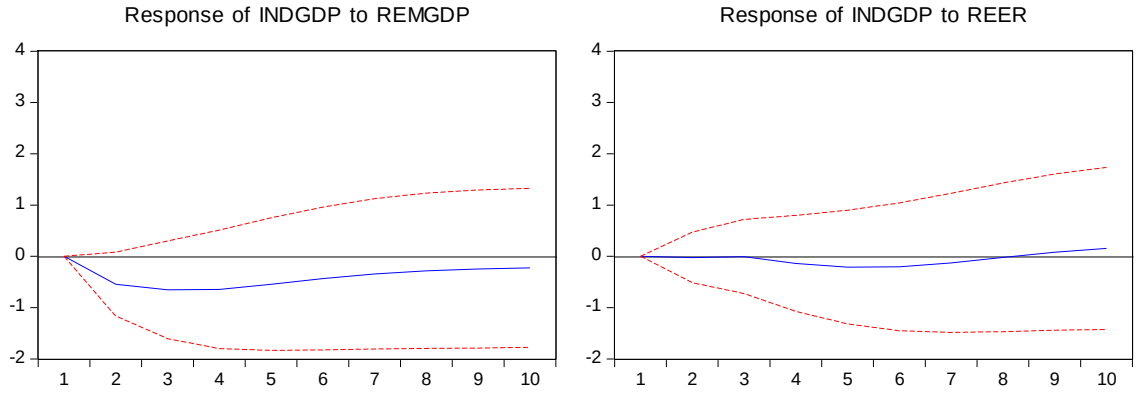
Response to Cholesky One S.D. Innovations ± 2 S.E.



(e)

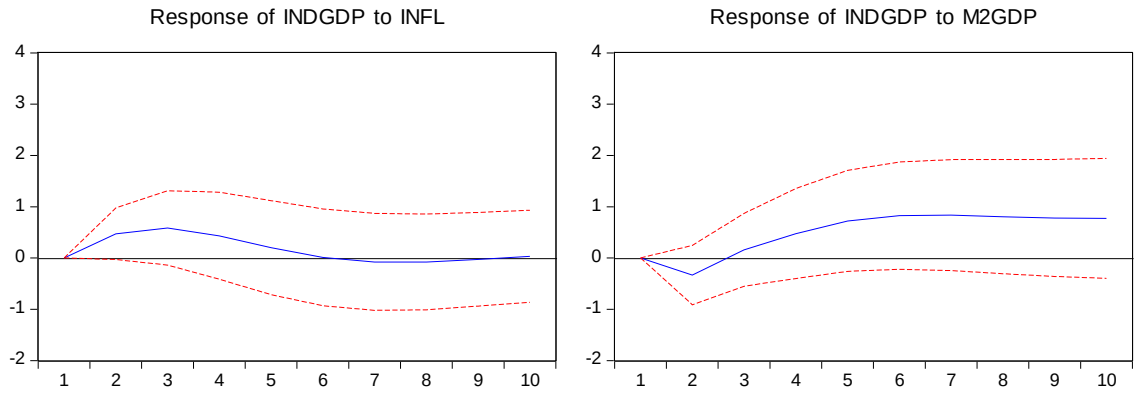
Figure 6.2: Impulse Responses of Agriculture to Shocks in Remittance and Other Variables

Response to Cholesky One S.D. Innovations ± 2 S.E.Response to Cholesky One S.D. Innovations ± 2 S.E.



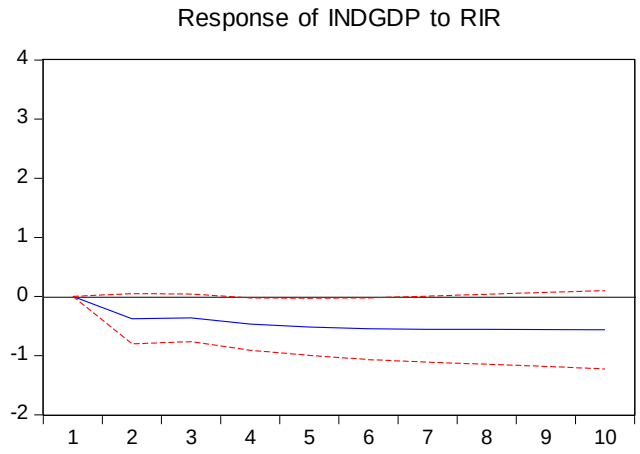
(a) (b)

Response to Cholesky One S.D. Innovations ± 2 S.E.Response to Cholesky One S.D. Innovations ± 2 S.E.



(c) (d)

Response to Cholesky One S.D. Innovations ± 2 S.E.



(e)

Figure 6.3: Impulse Responses of Industry to Shocks in Remittance and Other Variables

6.5.4. Variance Decomposition Analysis

We deployed variance decomposition to determine the proportion of the variance in the tradable sector that is explained by remittances. The result for the agricultural sector is reported in Table 6.6 while that of the industrial sector is reported in Table 6.7. From Table 6.6 it is seen that the share of remittances in the forecast error increased from 0.007 per cent in the second period to 0.281 per cent in the tenth period. Remittances constitute less than five per cent of non-own forecast error of the agricultural sector in the tenth period.

Turning to the result of the industrial sector, which is presented in Table 6.7, it is seen that the share of remittances to industrial sector forecast error oscillates over the ten periods. It rose from 4.897 per cent in the second period to its peak value in the fourth period, which stood at 9.374 per cent and then started to decline gradually to 7.474 per cent in the seventh period. By the end of the tenth period, remittances contributed 5.585 per cent of the industrial sector forecast error while the industrial sector contributed 61.473 per cent of its own forecast error. This suggests that remittances constitute less than 20 per cent of industrial non-own forecast error.

Table 6.6: Variance Decomposition Analysis – Agricultural Sector

Period	AGRIGDP	REMGDP	REER	INFL	M2GDP	RIR
1	100.000	0.000	0.000	0.000	0.000	0.000
2	90.677	0.007	1.253	2.014	0.111	5.939
3	85.581	0.014	1.075	6.619	1.675	5.036
4	82.696	0.106	1.052	7.803	2.532	5.811
5	81.478	0.150	0.998	7.593	2.430	7.351
6	81.497	0.191	1.075	7.594	2.412	7.230
7	81.303	0.230	0.992	7.856	2.496	7.124
8	80.830	0.251	0.944	8.183	2.472	7.319
9	80.520	0.270	0.903	8.502	2.421	7.386
10	80.312	0.281	0.869	8.750	2.400	7.388

Table 6.7: Variance Decomposition Analysis – Industrial Sector

Period	INDGDP	REMGDP	REER	INFL	M2GDP	RIR
1	100.000	0.000	0.000	0.000	0.000	0.000
2	87.231	4.897	0.009	3.665	1.841	2.357
3	81.138	8.040	0.006	6.260	1.516	3.040
4	77.266	9.374	0.164	6.172	2.983	4.042
5	74.865	9.172	0.413	5.052	5.663	4.835
6	73.532	8.355	0.550	4.072	8.064	5.427
7	73.014	7.472	0.530	3.421	9.719	5.843
8	72.972	6.714	0.456	2.961	10.740	6.157
9	73.070	6.096	0.422	2.603	11.395	6.415
10	73.116	5.585	0.444	2.325	11.889	6.640

6.6. IMPACT OF REMITTANCES ON THE TRADABLE SECTOR

6.6.1. Agricultural Sector

Table 6.8 shows both the long-run and short-run estimates of the effects of remittances on agricultural output expressed as a share of GDP. The estimate shows that remittances influence the agricultural sector positively with a value 0.051 per cent and 0.47 per cent in the short run and long run respectively. An appreciation of Nigerian naira has a negative effect on agriculture. This is in line with the a priori expectation as appreciation makes the tradable sector less competitive. A one per cent increase in the value of real effective exchange rate will lead to 0.24 per cent decline in agricultural output, though not significant. In terms of the monetary policy, an expansionary monetary policy improves agricultural output in the short run as a one per cent rise in the ratio of broad money to GDP will bring about 0.01 per cent rise in agricultural output. But expansionary monetary policy has a negative effect on agriculture in the long run. Interest rate has a negative effect on agriculture with -0.004 per cent in the short run and -0.01 per cent in the long run. Inflation influences agricultural output positively by 0.002 per cent in the short run but negatively with a value of 0.05 per cent in the long run. The ECT shows that the speed of adjustment to long-run equilibrium is very slow as the coefficient of the ECT is -0.152.

Table 6.8: Long-run and Short-run Estimate of the ECM Model

Variable	Coefficient AGRIGDP	Coefficient INDGDP
Short-run		
ΔREMGDP Remittance as a share of GDP	0.051** (0.024)	0.013 (0.040)
ΔREER Real Effective Exchange Rate	-0.243 (0.366)	-0.522 (0.457)
ΔM2GDP Broad Money as a percentage of GDP	0.010 (0.020)	-0.187*** (0.046)
ΔRIR Real Interest Rate	-0.004 (0.005)	0.050*** (0.016)
ΔINFL Inflation	0.002 (0.009)	-0.006 (0.016)
ECT(-1)	-0.152*** (0.047)	-0.356** (0.165)
Long Run		
Constant	29.779*** (3.309)	65.772*** (4.399)
REMGDP Remittance as a share of GDP	0.473*** (0.110)	0.103 (0.151)
REER Real Effective Exchange Rate	-1.711** (0.631)	-2.064*** (0.703)
M2GDP Broad Money as a share of GDP	-0.048 (0.060)	-0.316*** (0.062)
RIR Real Interest Rate	-0.010 (0.026)	0.081*** (0.026)
INFL Inflation	-0.050* (0.024)	0.029 (0.026)
Diagnostics		
R-Squared	0.770	0.420
D-W	1.873	2.096
Normality	0.380	0.950
Breusch-Godfrey Serial Correlation LM Test	0.903	0.653
Heteroskedasticity test: ARCH	0.111	0.132
CUSUM test	Stable	Stable

Note: standard error in parenthesis and *, ** and *** depict significance at the 10%, 5% and 1% levels respectively

6.6.2. Industrial Sector

The other sub-sector to be considered is the industrial sector. In both the short run and the long run, remittances have a positive effect on the industrial output. A one per cent rise in remittances will bring about a lead of 0.013 per cent and 0.10 per cent in industrial output both in the short run and long run respectively. However, an appreciation of the real effective exchange rate will lead to a fall in the industrial output in both the short run and long run. A one per cent rise in exchange rate will lead to 0.52 per cent and 2.06 per cent fall in industrial output in the short run and long run respectively. Expansionary monetary policy has a -0.187 per cent effect on industrial output in the short run and -0.316 per cent in the long run. These values are significant at ten per cent respectively. However, real interest rate has a significant positive effect on industrial output. Inflation has a negative effect in the short run but positive impact in the long run. The coefficient of the ECT has a negative sign and it is significant at five per cent. The coefficient suggests that 35 per cent of the shock in the current year is accounted for. The results of the variance decomposition function, impulse response and disaggregated ECM results for the two sub-sectors are displayed in Appendix 2.

6.7. ROBUSTNESS TESTS

Given the drawback of traditional unit root in the presence of structural break (Perron, 1989). In this, we deployed structural break unit root test and cointegration test. Since unit root and structural breaks are related, the use of unit root test that does not accounting for structural breaks such as ADF, PP and KPSS might leads to false inference. Perron (1989) then stressed that non-stationarity of macroeconomic data can be attributed to structural changes in the economy, and as such the traditional unit root test are biased towards false unit root when the data are trend stationary with structural break. Hence, by including structural break date to the unit root equation ensure that the bias is eliminated. Perron (1989) developed the first unit root test with structural break date. Under this approach, the break date is determined exogenously. However, subsequent approaches by Zivot and Andrews, (1992); Banerjee et al (1992); and Perron, (1997) innovate and incorporate endogenously determined single break date from the data.

In this study, Perron (1997) structural break unit root test is used. This test include the time trend and the time at which structural change occurs. The results obtained are reported in Table 6.9. It shows that in first difference all the variables are stationary. Our finding here is consistent with the results obtained under the traditional unit root test as reported in Table 6.3.

Table 6.9: Structural Break Unit Root Test – Perron (1997)

Variable	Intercept only		Both intercept and trend	
	t-statistics	Break point	t-statistics	Break point
	Level			
AGRICGDP	-9.364***	2001	-9.292***	2001
INDGDP	-3.074	2005	-4.929*	2002
REMGDP	-6.220***	2004	-4.035	1998
REER	-4.366	1998	-3.319	1993
M2GDP	-4.685*	2006	-5.309**	1998
RIR	-7.059***	1995	-6.923***	1995
INFL	-4.171	1999	-4.850	1998
	First difference			
AGRICGDP	-6.483***	2001	-17.941***	2001
INDGDP	-7.605***	2006	-7.654***	2005
REMGDP	-6.578***	2007	-6.781***	2003
REER	-5.045**	1999	-13.015***	1998
M2GDP	-6.210***	2005	-6.118***	2004
RIR	-7.525***	2010	-7.891***	2009
INFL	-7.085***	1995	-9.270***	1995

Note: *,**, and *** denote statistical significant at 10%, 5% and 1% respectively.

We also used test for the existence of long-run relationship in the presence of structural break using Gregory and Hansen (1996) test. Gregory and Hansen test is a residual based cointegration test like Engle and Granger test. While Engle and Granger test does not account for structural break in ascertaining whether or not long-run relationship holds among non-stationary variables, Gregory and Hansen incorporate structural break and the break date is determined endogenously from the data. The usefulness of this type of test could be linked to the possibility of structural or regime change. Gregory and Hansen (1996) argued that traditional cointegration test such as Engle and Granger test is inappropriate when regime change makes linear combination of variables shift at one unknown date in the sample. To address the above mentioned shortcoming, Gregory and Hansen (1996) developed ADF, Za and Zt tests in the presence of structural break.

We test for both regime shift in intercept as well as in intercept and trend. Our study findings are reported in Table 6.10. It shows that in the presence of structural break, while the variables are non-stationary, linear combination of the variables exhibit stationarity. This implies that long-run relationship holds when tradable – agriculture and industrial sector output and remittance as well as other control variables. In addition, the results of the structural break co-integration test is consistent with the conventional cointegration test results reported in Table 6.4.

Table 6.10: Structural Break Cointegration Test – Gregory and Hansen

	Agricultural sector		Industrial sector	
	Level shift	Level shift with trend	Level shift	Level shift with trend
t-statistics	-5.804	-4.838	-3.833	-5.380
Lag	1	0	0	1
Break	1999	2000	2007	2003
Za-stat	0.283	0.283	-0.611	-0.611
Za-break	1984	1984	1984	1984
Zt-stat	0.784	0.784	-2.153	-2.153
Zt-break	1984	1984	1984	1984

6.8. CONCLUSION

This study investigated the transmission channels and the effect of remittances on the tradable sector in Nigeria. The tradable sector is sub-divided into two sub-sectors, namely the industrial sector and the agricultural sector. The ECM results for the two sub-sectors show that remittances have positive effects on both industrial output and agricultural output even when the exchange rate appreciates. Even though this is against the a priori expectation, the findings are supported by the study of Adams (2009), which explains the possibility of remittances having positive effects on the tradable sector. The significance and negative sign of the ECT implies that after a shock in the short run, the economy adjusts to its long-run equilibrium even though at different speeds of adjustment. The findings therefore do not give support to the presence of Dutch disease in Nigeria. Since remittances have a positive effect on the tradable sector, more inflow of remittances should be encouraged into the country.

CHAPTER 7

EFFECTS OF REMITTANCE INFLOWS ON THE COMPETITIVENESS OF THE AGRICULTURAL AND MANUFACTURING SECTORS

Abstract

In the development sphere, remittances have been identified to have the potential of being a source of finance for development in the developing sector due to its large size compared to other external finance flows. This explains the continued attention given to remittance within the last two decades as evidence in the number of studies examining the impact as well as determinant of remittance inflow in developing countries. An area that is less researched is the consequence of remittance on the competitiveness of the agricultural and manufacturing sectors. Thus, this study empirically investigated the consequence of remittance inflows on the competitiveness of agricultural and manufacturing sectors in Nigeria. Annual data which were sourced from World Bank's World Development Indicator (WDI) were used. The data spanned from 1981 to 2015. In this study, we measured the competitiveness of the agricultural and manufacturing sectors as agricultural value added and as a percentage of GDP as well as manufacturing value added as a percentage of GDP respectively. In this study, we employed ARDL estimation techniques, as it enabled us examine the dynamics between remittances and agricultural as well as the manufacturing sector in Nigeria. Our results showed that remittances erode competitiveness in the agricultural sector in Nigeria whereas it stimulates manufacturing sector competitiveness. Since, remittances have divergent consequence on the agricultural and the manufacturing sectors, the government needs to make agricultural sector more attractive and put in place policies that will encourage more investment in the manufacturing sector.

Keywords: Remittance, Competitiveness, Agriculture, Manufacturing, Nigeria.

JEL Classification: F24, L60, N57, C32

7.1. INTRODUCTION

Russell (1986) defined remittances as the fraction of emigrant workers' earnings sent home from the country of employment to the country of origin of the sender. The motive for sending money home by the migrant has been categorised into two, namely altruism and self-interest. Self-interest motive implies that international migrant workers remit money for the purpose of investment, with the expectation of earning return from it in the future, whereas altruism motive implies that migrant workers remit money due to their care for their family. In other words, due to the need to assist their family members to meet their financial needs, hence, from the literature, remittances have been identified to be used largely to purchase food items and non-food items such as investment in housing, land, education and factory.

According to de Haas (2012), due to the surge in the flow of remittances in the 2000's, as well as the decline in the inflow of foreign aid to developing countries, policy makers, academia and development practitioners begin to have a change of perspective on the potential impact of remittances on the recipient's economy. They changed from a pessimistic to an optimistic view, the change in perspective cannot be disconnected from the fact that more remittances are been sent to the developing countries in recent times than ever before. The optimistic view argued that remittance inflows have the potential of stimulating development in developing countries. Studies have shown that remittance inflows contribute to reduction in poverty (Adams and Cuecuecha, 2013), increase in human capital formation (Ngoma and Ismail, 2013) as well as real exchange rate appreciation which erodes the competitiveness of the economy of the recipient developing countries (Bayangos and Jansen 2011; Naceur et al, 2011). The above study confirmed the claim by Russel (1986) that remittances inflow is associated with benefit and cost. According to the author, benefit of remittances are as follows: (i) remittances inflow ease foreign exchange constraints, (ii) it improves the balance of payment position of the recipient countries, (iii) it permits imports of capital goods and raw materials for industrial development, (iv) it serves as potential source of savings and investment capital for development, (v) it raises the immediate standard of living of the recipient economy as it raises the disposal income of those receiving the remitted money. On the other hand, the following were highlighted as the cost of remittances: (i) they are unpredictable, thereby making investment planning difficult, (ii) it leads to increase in inflation arising from increase in demand due to large fraction of remittances spent on consumption goods, (iii) it could exacerbate recipient countries' Balance of Payment problem, due to high import composition of the consumption finance through remittances and (iv) it could also increase the cost of production, eroding the recipient countries

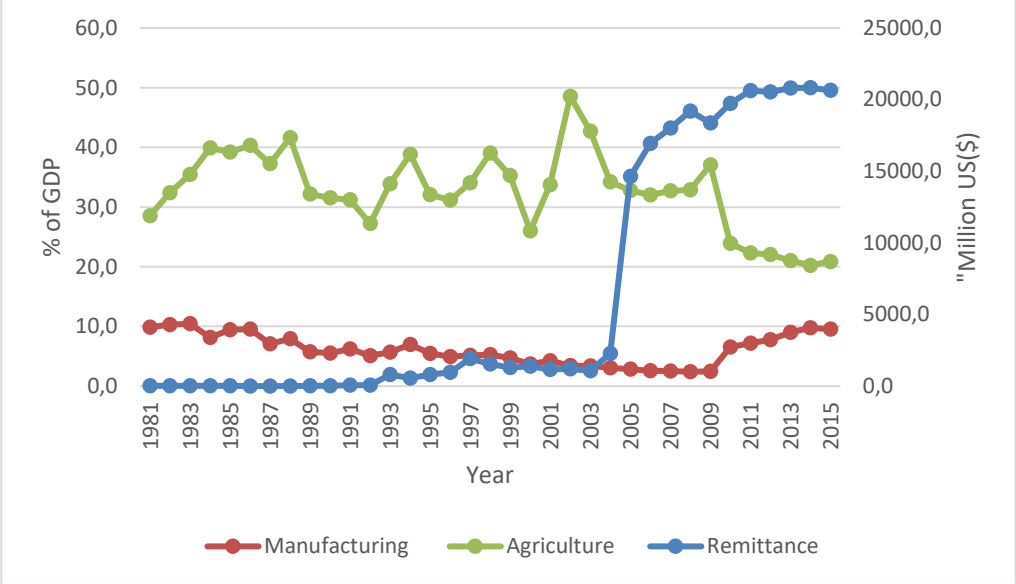
export competitiveness, which arises from increase in wages, since remittance inflows lead to increase in reservation wage.

To the best of the researcher's knowledge, an area that is rarely examined in literature is the consequence of remittances on the competitiveness of the agricultural and the manufacturing sectors of an economy. Since, remittances are usually used by households to purchase goods produced in the sector, it raises the cost of labour, which translates into increase in the cost of production. Thus, this study examined this issue using Nigeria as a case study. Nigeria attracted the highest remittance inflow in Africa in 2015, totalling $20.8billion. Does this huge inflow have any consequence on the performance of both sectors in Nigeria? Second, the performance of both sectors in Nigeria can be said to be unimpressive especially for the manufacturing sector as depicted in Figure 7.1. From 1981 to 2015, the share of manufacturing to GDP was less than 15% whereas that of the agricultural sector oscillated around 35%, except for the fact that since 2009, the share of the sector to GDP has been on the declining path. It might be important to examine the role of the huge remittance inflows on the competitiveness of the agricultural and manufacturing sectors in Nigeria.

Our results point out that in Nigeria, remittances erode competitiveness in the agricultural sector whereas they stimulate manufacturing sector competitiveness. The competitiveness role of the remittance on the manufacturing sector can be attributed to the ease of foreign exchange used to acquire inputs used for production in the sector. Arising from our study, the Nigeria government need to ease the procedures required in sending money home by the emigrant workers to their family and relatives in Nigeria. Second, since remittances have divergent consequence on the competitiveness of the agricultural and the manufacturing sectors, the government needs to look for a way to make agricultural sector more attractive for people to invest in and ensure further investment in the manufacturing sector

In the subsequent section, which is section 2, we present the review of the literature. In section 3, we describe the data and the methodology used in the study. Our empirical findings are presented in section 4. In section 5, which is the concluding section, we present the summary and provide recommendations arising from our study.

Figure 7. 1: Remittance, Agricultural and Manufacturing output as share of GDP in Nigeria, 1981-2015



Source: Authors computation based on World Development Indicators dataset.

7.2. LITERATURE REVIEW

Studies examining the consequence of remittance on the development of the developing economies have been on the increase within the last two decades. This can be associated with the observed high inflow into developing countries relatively to other external sources of funds, as a result, policy makers and academia are posed with the question, can remittances serve as source of finance for development (Chami et al 2005, de Haas, 2012)? The question whether remittance can be regarded as a source of finance for development in developing countries was addressed by Chami et al (2005), they claimed that for remittances to be regarded as a source of finance for development, in addition to foreign direct investment and other external finances, remittances must have positive effects on economic growth. The author made an attempt in answering this question by focusing on 113 developing countries using data spanning from 1970 to 1998. The author employed cross-sectional analysis and instrumental fixed effect estimator, in order to take the advantage associated with cross-sectional variation, the following conclusions were arrived at. First, remittances exhibit countercyclical behaviour, such that remittance inflows are high during economic hardship in countries of origin, which are captured by increase in income gap. Second, remittances have significant negative effects on economic growth. Based on their findings, the authors concluded that it will be misleading to regard remittances as an additional source of development finance and by extension, a medium of achieving economic competitiveness. Since, competitiveness of an economy can only be achieved via sustained economic growth.

De Haas (2012) points out that there exists two contemporary views on the role of remittance in stimulating development in recipient economies based on its preserved source of finance. These are the pessimistic and optimistic views. According to the author, the two views are based on similar assumptions on the need to remit money. Their divergence is based on the view that remittances are used for productive investment-optimistic view whereas pessimistic view considers the use of remittance to be unproductive. According to the optimistic view, as labour migrate from their origin, where it is in excess or idle, to another location where it is in high demand, the reallocation of resources creates avenue for higher productivity of the migrant, hence, they could positively impact their origin by sending part of their earning home. The money sent home could be used to augment the income of the family at home. The pessimistic view on the developmental role of remittance anchors their argument on the preserved misuse of remittance by their family as well as its resulting effects on labour force participation rate, wage reservation level, cost of production and its resultant effects on competitiveness of the economy. The author bridged the gap between the two views by introducing development condition into the argument. According to the author, if the development condition is unfavourable, regardless of the use of remittance, its impacts on development will not be felt. Hence, the author advocated that developing countries need to work on development condition in order to realise the benefits associated with remittance (de Haas, 2012; pg 20). The negative impact of remittance on economic growth observed by Chami et al 2005 could be attributed to poor developmental conditions in remittance recipients' countries. In line with the submission by de Haas (2009), the study by Catrinescu et al (2009) examined the role of institution in the relationship between remittances and economic growth. The study covers 1971 to 2003. The findings of the study can be summarised as thus, increase in remittances devoid of endogeneity and conditioned on institutional quality contributes positively to economic growth. In the study, different measures of institutions were considered. The results are robust to the measure of institution.

Nwaogu and Ryan (2015) contribute to the study as regards the role of external finance on economic growth by considering the impact of spatial interdependency on economic growth, they considered two regions, namely Africa and Latin America. A total of 53 countries were examined in Africa whereas a total of 34 were considered from Latin America. A new technique called dynamic spatial model was used in their study. They found out that the way remittances affect economic growth is different in the two regions. Their results show that remittances have negative effects on economic growth in African countries whereas in Latin America, the effects of remittances on economic growth are positive. The authors attributed the differences in the role of remittances on economic growth to the way remittances are used in the two regions considered in the study. According to them, remittances are in productive use in Latin America whereas in Africa, they are used in an

unproductive way. This implies that misuse of remittances has a consequence on the economy. This can be attributed to its adverse effects on cost of production, since remittances raise reservation wage.

Further, Adams and Cuecuecha (2013) examined the developmental role of remittance in terms of its impacts on investment and poverty in Ghana. The authors used 2005-2006 Ghana living standard survey and arrived at a sample size of 3941. To address selection bias problem associated with data gathered from survey, the authors used two-stage multinomial logit model. Their findings can be classified into two. First, households spend more on education, housing and health and spend less on food. Second, reduction in poverty level in Ghana is positively related to increase in remittance inflow. Further, Ngoma and Ismail (2013) attempted to provide answer to the question relating to the role of remittances on human capital formation, they examined whether remittances promote human capital formation in a group of 89 developing countries using five years' average data spanning from 1970 to 2010. Their result revealed that remittances do not only ease liquidity constraint associated with schooling but also leads to increase in schooling in developing countries. The implication of their findings is that remittances have the capacity to promote human capital formation in developing countries.

Based on the foregoing, we examined the effect of remittance on the competitiveness of the economy. Here we selected few existing studies in this area to understand what has been investigated so far. We observed that majority of the existing studies that attempted to answer the question, examined competitiveness from the perspective of export performance. Hence, they argued that a county's competitiveness is eroded when such country is experiencing real exchange rate appreciation. It is only the study by Lartey et al (2012) that measured competitiveness based on the decomposition of output. Bourdet and Falck (2006) examined the effect of remittance on the competitiveness of Cape Verde. The scope of their study was 1980 to 2000. The authors made use of ordinary least squared (OLS) and found out that remittance inflows erode Cape Verde's competitiveness, as the authors were unable to reject the Dutch disease hypothesis. Further, they compared the effect of remittances on competitiveness to foreign aid. Their findings showed that the loss of competitiveness is higher under remittance than foreign aid. A separate study by Acosta et al (2009) examined the effect of remittances on the competitiveness of the El Salvador economy, they made use of quarterly data spanning from first quarter of 1991 to the second quarter of 2006. In this study, competitiveness was measured based on real exchange rate and the ratio of output produced in tradable to non-tradable sector. The authors justified the appropriateness of Bayesian Vector Autoregressive technique for their study as it addresses the problem associated with small sample as well as identification of the problem of the reduced form models. They found out that regardless of the motive for remittances in

El Salvador, whether it is motivated by altruism or self-interest, it leads to loss of competitiveness of the economy. According to them, remittances lead to permanent increase in disposable income, contributing to increase in consumption as a large fraction of remittances are not saved. In addition, remittances lead to reduction in labour supply. The combined effect of increase in consumption and reduction in labour supply is the reallocation of resources in the economy from tradable to non-tradable sector. Hence, the tradable sector output reduces, depicting loss in the competitiveness of the economy. The result obtained by Bayangos and Jansen (2011) is not totally different from previous country specific studies on the negative effect of remittance on competitiveness. They contributed to the issue by considering the effect of remittance on competitiveness via the labour market. They examined the link by providing theoretical link between remittance work effort, leisure and education. According to them and as documented in the migration and remittance literature, increase in remittance inflow contributes to fall in work effort as they have access to alternative source of income that does not require any effort. In addition, it leads to increase in leisure as people have more income to spend on recreation, and lastly, increase in educational enrollment. The combined effect of reduction in work effort, increase in leisure and educational enrollment leads to a drop in labour supply which translates to increase in wage rate and then increase in the cost of production. A firm that is experiencing high cost of production becomes less competitive in the global market, and is limited to its domestic market. As a result, they attribute loss of competitiveness of Philippine economy to remittance inflow.

Rozelle et al (1999) provided micro-level evidence on the influence of migration and remittance on China's agricultural productivity. The authors employed three-stage least squares. Their results can be summarised as follows, migration reduces agricultural yield, remittances increase agricultural yield and the net effect of migration and remittances on china agricultural yield is negative. The authors claimed that the negative net effect of remittances on agricultural yield is because migrants from China are found to be very reluctant in sending money to their family. Rajan and Subramanian (2011) examined the effect of foreign aid on manufacturing growth via the Dutch disease hypothesis. The authors found out that manufacturing sector experiences contraction due to overvaluation of the exchange rate resulting from foreign aid inflows. This can be linked to the remittance flows, if remittance flows lead to real exchange rate appreciation.

In addition to the above country specific studies, Naceur et al (2012) and Lartey et al (2012) provided evidence from pool of developing countries. Lartey et al (2012) examined 109 countries using data spanning from 1990 to 2003. Based on the potential endogeneity problem, the authors employed GMM. Three measures of competitiveness were used in the study, namely real exchange rate, ratio

of tradable sector output to non-tradable sector output and the decomposition of output, that is the share of agricultural and manufacturing to GDP. Their results were in line with the result obtained under country specific study. Specifically, the result showed that increase in remittances flow lead to fall in the share of agriculture and manufacturing output as a share of GDP. However, the effect of remittances was higher in the manufacturing sector than the agricultural sector. The authors claimed that relative low impact of remittances on agriculture compared to the manufacturing sector is because the agricultural sector is more of a non-tradable sector than a tradable sector compared to the manufacturing sector which is largely a tradable sector. Naceur et al (2012) provided information on the effect of disaggregated capital flow on developing competitiveness, they categorised developing countries into six, namely, GCC, South and East Asia, Latin America, and CEEC. In addition, as pertaining to the capital flow considered, they are as follow: remittances, Foreign aid, portfolio, income and debt. The authors employed GMM estimator. Their findings reveal that the impact of remittance on competitiveness is diverse across regions. Remittances were found to exhibit negative and significant effects on Africa, GCC, South and East Africa competitiveness but insignificant effect in Middle East and North Africa. However, they found out that remittance has significant positive effect on CEEC competitiveness whereas it has positive and insignificant effect on Latin America competitiveness. The observed divergent effect, especially between Africa and Latin America was further supported by the findings of Nwaogu and Ryan (2015).

Slightly different from previous studies, Mamum et al (2015) examined the impacts of remittances on domestic labour productivity. The authors' study focused on 61 developing countries using data spanning from 1980 to 2012. They employed augmented mean group estimation technique and corrected for cross-sectional dependency arising from the possible impacts of remittance inflows into one country and on the remittance inflows of another country included in the sample. They measured labour productivity as the output per worker of active population, which exclude women. The authors confirmed country specific characteristics on the impact of remittances on labour force. Also, they found out that financial development increases the positive impact of remittance on labour productivity. In addition, they argued that the positive impact of remittances on labour productivity is strengthened as the volatility of nominal exchange is curtailed.

In summary, existing literatures point out that remittance flows could either be beneficial to an economy or detrimental to the development of the economy. The increasing attention paid to remittances is yet to be evident in terms of studies that aimed at testing its consequence on the competitiveness of the agricultural and manufacturing sector. Thus, this study fills the gap by using

Nigeria as a case study and thereby examined whether remittance inflows enhance or deter the competitiveness of the agricultural and manufacturing sectors of the economy.

7.3. METHODOLOGY

7.3.1. Model Specification

Sall (2000) describes three aspects of competitiveness. Competitiveness can be measured along three dimensions, namely volume, price and technology. In terms of volume, this can be an increase in external market share (exports) or internal market share (import substitution). While price can be looked at in relation to foreign exchange, a comparison of FOB prices expressed in dollars and a world price can help to work out the competitiveness of a good in the form of foreign exchange rate. Also, technologies leading to a monopoly or advantages over competitors, based on patents or on innovations in the product can make a sector more competitive.

The ability to increase market share with existing or future products because of technological progress, innovations, price, quality or productivity contributes to the competitiveness of a sector. However, Lartey et al. (2012) empirically measured the competitiveness of a particular sector as the share of the sectorial output in GDP. Based on the foregoing and following the work of Chami et al. (2005), the impact of remittance inflows on the competitiveness of Nigeria's agricultural and manufacturing sector can be specified as follows:

$$AG_t = f(RE_t, GE_t, OP_t, IN_t) \quad (1)$$

$$MA_t = f(RE_t, GE_t, OP_t, IN_t) \quad (2)$$

Where:

AG = Agricultural value added as a percentage of GDP

MA = manufacturing value added as a percentage of GDP

RE = Remittance inflows

GE = Government expenditure

OP = Economic openness

To estimate the models, we take the natural logs of equations (1) and (2) which yields equations (3) and (4) below:

$$lnAG_t = \alpha_0 + \alpha_1 lnRE_t + \alpha_2 lnGE_t + \alpha_3 lnOP_t + \alpha_4 lnIN_t + \epsilon_t \quad (3)$$

$$lnRE > 0, lnGE > 0, \text{lnOP} > 0, \text{and lnIN} > 0$$

$$lnMA_t = \beta_0 + \beta_1 lnRE_t + \beta_2 lnGE_t + \beta_3 lnOP_t + \beta_4 lnIN_t + \mu_t \quad (4)$$

$$lnRE > 0, lnGE > 0, \text{lnOP} > 0, \text{and lnIN} > 0$$

For agricultural competitiveness model, ϵ_t is the error term where α_0 is the constant and α_1 to α_4 are parameters coefficients. While for manufacturing model, μ_t is the error term where β_0 is the constant and β_1 to β_4 are the parameter coefficients. All coefficients are expected to be positive and the impacts of remittance inflows on agricultural competitiveness as well as manufacturing competitiveness follow the optimistic view that if remittances are used for productive investment, it will promote growth in the beneficiary sector (De Haas, 2012). Economic openness is measured by the ratio of the sum of export and import to GDP and through trade liberalisation, induces accelerated growth in manufacturing and agricultural sectors of the economy (De silva et al., 2014, Umoh and Effiong, 2013).

7.3.2. Estimation Technique

In order to test the cointegration properties of the estimated equations, ARDL or bound testing cointegration approach proposed by Pesaran et al. (2010) is utilised. This test has the advantage that it can be applied irrespective of whether the regressors in the estimated equations are stationary at level or first differenced stationary. This avoids the pretesting problem associated with the conventional methods. Moreover, the test is free of the endogeneity problem so long there is no residual correlation in the models (Baharumshah, 2009).

In this study, ARDL method is relied upon for the analyses of the consequence of remittances for the competitiveness of agricultural and manufacturing sectors. There will be two ARDL models to capture the effects of remittances on the two sectors separately, therefore, the specification of ARDL for the two sectors are given in equations (5) and (6).

$$lnAG_t = \alpha + \gamma_1 lnAG_{t-1} + \gamma_2 lnRE_{t-1} + \gamma_3 lnGE_{t-1} + \gamma_4 lnOP_{t-1} + \gamma_5 lnIN_{t-1} + \sum_{i=1}^{p} \theta_i \Delta lnAG_{t-i} + \sum_{i=0}^{p} \delta_i \Delta lnRE_{t-i} + \sum_{i=0}^{p} \mu_i \Delta lnGE_{t-i} + \sum_{i=0}^{p} \pi_i \Delta lnOP_{t-i} + \sum_{i=0}^{p} \tau_i \Delta lnIN_{t-i} + \varepsilon_t \quad (5)$$

$$lnMA_t = \alpha + \gamma_1 lnAG_{t-1} + \gamma_2 lnRE_{t-1} + \gamma_3 lnGE_{t-1} + \gamma_4 lnOP_{t-1} + \gamma_5 lnIN_{t-1} + \sum_{i=1}^{p} \theta_i \Delta lnAG_{t-i} + \sum_{i=0}^{p} \delta_i \Delta lnRE_{t-i} + \sum_{i=0}^{p} \mu_i \Delta lnGE_{t-i} + \sum_{i=0}^{p} \pi_i \Delta lnOP_{t-i} + \sum_{i=0}^{p} \tau_i \Delta lnIN_{t-i} + \varepsilon_t \quad (6)$$

Where Δ denotes the first difference operator, $\propto$ is the drift component, γ_1 to γ_5 are coefficients the long run term, $\theta_i, \delta_i, \mu_i, \pi_i,$ and τ_i are coefficients of the short run term, ε_t is the usual white noise and the variables include AG, MA, RE, GE, OP and IN which are as defined earlier. The log of the variables was taken to normalise the data.

The testing follows three step estimation procedure. First, existence of long-run cointegrating relationship among the variables in the equations are tested for. The long run level relationship among the variables are determined using Wald-coefficient test of the F-test. Joint significance tests are performed to test the null hypothesis of no cointegration by setting the coefficients of all one lagged level of the function F_{AG} (RE, OP, GE, IN) equal to zero ($\gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = 0$) against the alternative hypothesis that ($\gamma_1 \neq \gamma_2 \neq \gamma_3 \neq \gamma_4 \neq \gamma_5 \neq 0$). Similar computation is carried out for F_{MA} (RE, OP, GE, IN) function in the second equation. Then the estimated F-statistic is checked for the null hypothesis whether all the long run coefficients are jointly equal to zero. At this stage, based on conventionally used significance levels (1%, 5%, and 10%), the calculated F-statistic is compared to the respective cases of bound critical values tabulated at Pesaran et al. (2001).

These critical values contain upper and lower bounds covering all possible classification of the variables into I(1), I(0) and mutually cointegrated. If the estimated-statistic appears larger than the upper bound of critical value, then the null hypothesis of no cointegration is rejected, which suggests that the variables included in the model are cointegrated. If the estimated F-statistic is smaller than the lower bound of critical value, then the null hypothesis of no cointegration cannot be rejected, which implies that the variables are not cointegrated. However, if the computed F-statistic falls in between the upper and lower bounds, then the decision is inconclusive regarding the null hypothesis of no cointegration. The short run model of the ARDL is reported nevertheless.

The second step is to estimate the coefficients of long run relationship and determine their value. This long run value is determined from the coefficient of one lagged level variables. And finally, in the third step, the short run estimated value from the coefficients of the first differenced variables of the ARDL model are calculated. The coefficients of the first differenced variables in the estimated ECM represent short run elasticities (Tang, 2003). When there is more than one coefficient in a particular variable, they are added and their joint significance is tested using the Wald-coefficient test. To ascertain the goodness of fit of the ARDL model, relevant diagnostic and stability tests are conducted. The diagnostic tests examine the normality, serial correlation, ARCH and heteroscedasticity associated with the model.

7.4. DATA SOURCES

This study empirically investigated consequence of remittance inflows for the competitiveness of agricultural and manufacturing sectors in Nigeria. Annual data which were sourced from World Bank's World Development Indicator (WDI) were used. The data span from 1981 to 2015. The period is chosen because it is difficult to find a suitable data for most of the variables used for the study outside the period. Moreover, there is a major consensus in the literature that quality data on remittances is extremely poor (World Bank, 2009). Most of the remittances inflow are transmitted through the informal channel such as public transportation providers, friends and family which are not recorded in Nigeria's balance of payments. Therefore, official data on remittance inflows (RE) might be underestimated, hence, the magnitude of the coefficient obtained from the study should be interpreted with caution.

However, concerning the agricultural and manufacturing sectors competitiveness, agricultural value added as percentage of GDP (AG) and manufacturing value added as a percentage of GDP (MA) are used as proxies respectively. Other variables of interest include investment (IN), measured by gross fixed capital formation, government expenditure (GE) and economic openness (OP).

7.5. EMPIRICAL RESULTS

7.5.1. Test of Unit Root

In practice, the choice of most appropriate unit root is difficult. Enders (1995) in Hoque and Yusop (2010) suggested that Augmented Dickey Fuller (ADF) and Phillips Perron (PP) should be used as safe methods of testing unit roots. If the two methods corroborate each other, then the results are more

reliable, therefore, ADF and PP tests are conducted on the variables of the model to test for unit root. The tests are performed at level and first difference for both with the intercept and trend term.

Table 7. 1 Unit Root Test Results

Augmented Dickey-Fuller (ADF)					
	Level		First Difference		
Variable	Constant	Constant and Trend	Constant	Constant and Trend	Conclusion
AG	-2.2581	-3.1776	-6.2211*	-6.3257*	I(1)
MA	-1.4529	-0.9513	-6.1278*	-6.8731*	I(1)
RE	0.0478	-1.6256	-4.4951*	-4.5378*	I(1)
IN	-0.4102	-3.0080	-3.3938**	-5.2370*	I(1)
GE	1.6727	-1.4785	-5.7752*	-7.5860*	I(1)
OP	-4.8966*	-4.9858*	-6.0076*	-5.8727*	I(0)
Phillip Perron (PP)					
	Level		First Difference		
Variable	Constant	Constant and Trend	Constant	Constant and Trend	Conclusion
AG	-2.2508	-3.1354	-8.0362*	-11.0029*	I(1)
MA	-1.5943	-0.4428	-6.1317*	-7.1371*	I(1)
RE	-0.1470	-1.7186	-4.4961*	-4.5378	I(1)
IN	-1.1441	-3.0306	-3.5626**	-4.6845*	I(1)
GE	2.0244	-1.3504	-5.7779*	-7.9451*	I(1)
OP	-4.9048*	-5.7579*	-9.1008*	-10.1761*	I(0)

Source: Author's computation from E-view 9. Note:*,**, and *** imply significance at 1%, 5% and 10% respectively.

AG is the log of agricultural value added as a percentage of GDP, MA is the log of manufacturing value added as a percentage of GDP, RE is the log of remittances, OP is the economic openness, GE is the Government expenditure and IN is gross fixed capital formation (or investment).

The optimum lag is selected by using the Schwartz Information Criterion (SIC). A summary of the ADF and PP unit root test results are presented in Table 7.1. Both tests' results show that with the exception of trade openness, which are stationary at level, all other variables are first differenced stationary at 5% significance level. The two tests therefore reinforce each other.

7.5.2. Results of the ARDL Bounds Test

In order to examine the impacts of remittances on agricultural and manufacturing competitiveness in Nigeria, the ARDL bound test approach is adopted. The model is estimated with four lags for the two equations using Schwarz Information Criterion (SIC). The results of the bound test are presented in Table 7.2.

Table 7.2 The Bound Test for the Existence of a level Relationship

Model	Calculated	Lag	Significance level	Critical bound F-statistics	
	F-statistics			I(0) bound	I(1) bound
F_{AG}(RE, OP, GE,IN)	2.5756[b]	4	10 %	2.45	3.52
F_{MA}(RE, OP,GE,IN)	9.9598[a]	4	5%	2.86	4.01
			2.5%	3.25	4.49
			1%	3.74	5.06

Notes: Estimation period (1981–2015) and all calculations were made using E-view 9.. .F-test

This is the statistics for testing zero restrictions on the coefficients of the lagged level variables in the particular model. The superscript a indicates that the statistic lies above the upper bound and superscript b indicates that it falls between the upper and lower bound. Source of critical values: Pesaran et al. (2001).

Table 7.2 reveals that the calculated F-statistics for equations 1 and 2 are 2.5756 and 9.9598 respectively. From the results obtained, the calculated F-statistics for manufacturing is larger than the upper bound at one per cent significance level whereas the calculated F-statistics for agriculture lies within the lower and upper bounds at 10 per cent significance level. This suggests that the null hypothesis of no cointegration is rejected for manufacturing (equation 2) while the test is inconclusive for agriculture (equation 1). Therefore, the long run relationship is confirmed among manufacturing value added as a percentage of GDP, remittances, economic openness, government expenditure and investment in Nigeria. The bound testing for equation 2 implies that the variables of the model move together and cannot move too far away from each other independently. It can therefore be concluded that any disequilibrium in the model is a short run phenomenon.

Due to the inconclusive nature of the cointegration result obtained for the agricultural sector, we did not proceed to long run estimation, we examined only the short run relationship between remittance and the agricultural sector competitiveness. On the other hand, we examined short and long run relationships between remittance and manufacturing sector competitiveness. The short run result for the agricultural sector is presented in Table 7.3, while the short and long run results for manufacturing are presented in Tables7.4 and 7.5, respectively.

Table 7.3 Short-run Model for Agricultural competitiveness function

$\Delta logAG$ =	$0.442\Delta logAG_{t-1}$ (02200)**	-0.023ΔlogRE (0.0224)	0.260ΔlogOP (0.2545)	0.267ΔlogGE (0.2457)	-0.372ΔlogIN (0.2333)***
Diagnostic test	RESET	JB	LM	ARCH	
F-statistics	2.1252	0.0432	0.8245	0.0023	

P-value	0.1579	0.9787	0.3729	0.9624	

Notes: Figures in parentheses ( ) indicate the standard errors and *, ** and *** denote statistical significance at 1%, 5 % and 10 % level respectively. Δ means the first difference and F-test is the restriction test imposed on the parameter of the model. The test statistics are: LM = Lagrange multiplier test for autocorrelation; JB = Jarque–Bera test for normality of residuals; ARCH = Engle's autoregressive conditional heteroskedasticity test and RESET = Ramsey's test for functional form misspecification. For definition of the variables, see Table 7.1.

In explaining short run relationship among the variables in equation 1, it is good to start with the variable of interest. Table 7.3 shows that the coefficient of remittance is negative and insignificant. This result suggests that remittances inflow erode agricultural competitiveness in Nigeria, this is consistent with the findings of Scott et al. (1999) as well as Lartey et al (2012). Scott et al. (1999) found out that remittances have a negative net effect on agricultural productivity. This is because remittances are rarely invested in the agricultural sector. They are used to acquire land for building houses, thus reducing the land available for farming. Other variables exert a positive effect on agricultural competitiveness apart from investment that has a negative effect.

Table 7.4 The Error Correction Representation for Manufacturing ARDL Model

Estimated Coefficients (Standard errors in Parentheses)				
ΔlogMA =	-0.112ΔlogRE (0.0505)**	+ 0.187$\Delta logRE_{t-1}$ (0.0549)*	+ 0.014$\Delta logRE_{t-2}$ (0.0537)	-0.117$\Delta logRE_{t-3}$ (0.0391)*
	+ 0.454ΔlogOP (0.3351)	+ 0.018ΔlogGE (0.4587)	+ 0.984$\Delta logGE_{t-1}$ (0.4225)**	-1.479$\Delta logGE_{t-2}$ (0.3880)*
	+ 1.356$\Delta logGE_{t-3}$ (0.3876)*	+ 0.272ΔlogIN (0.1963)	-0.393$\Delta logIN_{t-1}$ (0.1874)***	-0.370ECM_{t-1} (0.1257)**

Notes: Δ means the first difference and ECM_{t-1} is the error correction term. The superscripts *, **, and *** denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Having estimated the dynamic (short run) model of equation 1, we now proceed to estimate the error correction model for the manufacturing sector (equation 2) and the result obtained is presented in Table 7.4. Our empirical result is based on re-parameterisation of estimated ARDL (1,4,1,4,2) model. Our empirical result shows that changes in the remittances in the current period erode manufacturing sector competitiveness. But the lagged value of the changes in remittance spur manufacturing sector competitiveness. In addition, we found the lagged error correction term carries the expected negative sign and is statistically significant. In Baharumshah (2009), it was shown that a significant error correction term is an efficient way to show that cointegration exists among the variables in a model. The coefficient of the lagged error correction term is -0.37, it revealed that approximately 37 per cent of the previous year's discrepancy between the actual and equilibrium value of manufacturing competitiveness (MA) is corrected each year. Short-run dynamics in the model are captured by the lagged differences. The error correction term represents the potential effects of departures from the long-run equilibrium. The size and the significance of the error correction term in the equation show the tendency of each variable to restore equilibrium in the model.

Table 7.5 The Long-run model for manufacturing competitiveness function

logMA =	4.3870 (13.1250)	+0.0602logRE (0.0662)	-1.5251logOP (0.9344)	-4.1123logGE (1.5015)**	3.8935logIN (1.2266)*
Diagnostic Test	RESET	JB	LM	ARCH	
F-Statistics	1.4741	0.6118	1.7652	1.5705	
P-value	0.2481	0.7365	0.2087	0.2209	

Notes: Figures in parentheses ( ) indicate the standard errors and *, ** and *** denote statistical significance at 1%, 5 % and 10 % level respectively. Δ means the first difference and F-test is the restriction test imposed on the parameter of the model.

Table 7.5 represents the estimated long-run coefficients of the independent variables in equation 2 (manufacturing competitiveness function). Starting with the variable of interest, remittances, and the result presented in the table shows that an increase in remittance inflows contribute to an increase in manufacturing competitiveness (MA). More precisely, a 1% increase in the remittance inflows leads to 0.06 per cent rise in manufacturing competitiveness. This is contrary to Lartey (2012), their study

shows that remittance erode manufacturing sector competitiveness. Our result suggests that manufacturing sector output is supported by remittance, this implies that remittance plays a crucial role in boosting manufacturing sector competitiveness in Nigeria. This result is in line with the role of remittance in easing foreign exchange scarcity as it serves as a source of foreign exchange used by the manufacturing sector in acquiring manufacturing sector inputs, which are mostly imported. Furthermore, our result shows that trade openness exerts a negative effect on manufacturing competitiveness. This shows that Nigeria's manufacturing products when exposed to international competition are less competitive. The negative sign that the government expenditure received shows that it is not channelled to productive investment. The impact of investment is positive and statistically significant as expected.

In order to ascertain the adequacy of the specification of the models, a battery of diagnostic tests is applied to the empirical models. As shown in tables 7.3 and 7.5 for agriculture and manufacturing respectively, the computed Breusch–Godfrey Lagrange multiplier (LM) tests of 0.8245 and 1.7652 for AG and MA models are statistically insignificant at conventional significance levels. This suggests that the error term is serially uncorrelated in the two model.

In addition, the adequacy of the models are indicated by the result of the Ramsey RESET test and the F-statistics of the ARCH tests show that the residual of the models have constant variance. Also, the standard Jarque–Bera (J–B) normality test indicates that the error terms are normally distributed in the model. These statistics are insignificant at conventional significance levels. Despite the short span of data, the outcome of the diagnostic tests indicates the specification of the AG and MA functions are adequately specified and none suggest concern about the estimated model.

7.6. SUMMARY AND RECOMMENDATION

In the literature, remittance has been examined in the light of its effect on poverty (Adams and Cuecuecha, 2013) and human capital formation (Ngoma and Ismail, 2013); role as a source of development finance (Chami et al, 2005) as well as its impact on the competitiveness of the economy (Bayangos and Jansen 2011; Naceur et al, 2011). In examining its effect on the competitiveness of the economy, it has largely been examined with regards to its effect on real exchange rate. An appreciation of the real exchange rate as a result of remittance inflow is regarded as a loss of competitiveness. The effect of remittance on the competitiveness of the decomposition of the GDP is rarely examined. The study by Lartey et al (2012) which examined the effect of remittance on the competitiveness of the agricultural and manufacturing sectors was examined by pooling several developing countries together. There is possibility of divergent use of remittance. This varies across

regions and countries as pointed out by Nwaogu and Ryan (2015). Thus, this study examined the effect of remittance on the competitiveness of agricultural and the manufacturing sectors in Nigeria, which is among the top five recipients of remittance in absolute terms in Africa.

We perform cointegration test based on Bound test developed by Pesaran et al (2001). Our cointegration results show that the long-run relationship between remittance and competitiveness of the agriculture sector does not hold whereas long-run relationship holds between remittance and manufacturing sector competitiveness. Further, our results point out that in Nigeria, remittances erode competitiveness in the agricultural sector whereas it stimulates manufacturing sector competitiveness. Our result on the effect of remittance on the competitiveness of the agricultural sector is in line with Scott et al (1990) as well as Lartey et al (2012). In a separate study, they found out that remittances erode competitiveness of the agricultural sector. The observed effect was linked to the labour loss associated with remittance inflow as well as unproductive use of remittance by those receiving it. As for the competitiveness of the manufacturing sector, we found out that in Nigeria, remittances inflow enhances the competitiveness of the manufacturing sector. This is contrary to the findings of Lartey (2012) that remittances contribute to the loss of the competitiveness of the manufacturing sector in developing countries. As evident in our study, remittances inflow boost the competitiveness of the sector. The observed effect can be attributed to the role of remittances in providing foreign exchange required to purchase inputs, since the sector is import dependent for its input. There is need to examine whether the findings can be established in similar developing countries in Africa.

Arising from our study, the government needs to make the agricultural sector attractive. When the agricultural sector becomes attractive, there will be shift of resources towards it from its current unproductive investment usage. Second, since remittances enhance the competitiveness of the manufacturing sector, it serves as an alternative source of capital for the manufacturing sector. Hence, government policies should be aimed at reducing difficulties in starting-up manufacturing businesses as well as remitting money into the country.

CHAPTER 8
SUMMARY OF FINDINGS, POLICY RECOMMENDATIONS AND CONCLUSION

8.1. INTRODUCTION

This chapter focuses on the summary of the main findings of the research, policy recommendations and concluding remarks. Limitations of the study and suggestions for further research are also presented.

8.2. SUMMARY OF THESIS

The motivation for this research stems from the dramatic changes that have occurred in capital flows to Nigeria since the 1980s. Remittance inflows have assumed a vital role as a source of foreign exchange in many developing countries. The volume of remittance transfers to many developing countries has exceeded foreign direct investment (FDI) and official development assistance (ODA) inflows. This surge in remittance inflows has been felt in Nigeria. Between 1980 and 2011, remittances represented about 3.5 per cent of GDP in Nigeria (World Bank, 2014). Within the same period, FDI as a percentage of GDP was 3.1 per cent in Nigeria, while net ODA as a percentage of national income was 1.1 per cent (World Bank, 2014). These figures illustrate the dominant position of remittances when compared to other foreign inflows.

It is pertinent to highlight the peculiarity of the Nigerian foreign exchange market. The country's foreign exchange earnings are more than 90 per cent dependent on crude oil export receipts. It therefore follows that the volatility of the world oil market prices has a direct impact on the supply of foreign exchange. Like other financial inflows, remittances are intrinsically associated with the monetary aggregates. Remittances influence and may be influenced by monetary policies of the Central Bank of Nigeria.

The broad objective of the thesis was to ascertain whether remittances in Nigeria have Dutch disease effects. Dutch disease effect refers to the appreciation of the exchange rate through an increase in supply of foreign currency, thus hurting the competitiveness of the receiving economy. Over-valued exchange rates can make imports cheap in terms of domestic currency but expensive in terms of foreign currencies, thereby worsening the current account position of the domestic economy. Further, increased demand arising from remitted money raises prices in the non-tradable sector while the prices in the tradable sector are stable, especially in a small open economy, because the prices of the tradable sector are often determined internationally. The study examined the link between remittances

and the behaviour of the real exchange rate in Nigeria. It further examined the likely consequences of an overvalued exchange rate for the tradable and non-tradable sectors of the Nigerian economy.

The literature review presents divergent results regarding the Dutch disease effects of remittances. A review of Dutch disease theories such as the core model and extended exogenous growth model is provided. The theories of exchange rate such as: the purchasing power parity theory, the interest rate parity theory, Balassa-Samuelson theory, the monetary approach (theory), and the Mundell–Fleming approach (theory) were reviewed. Empirical evidence of linkages of remittances and Dutch disease were reviewed under different headings. The linkages include: capital inflows and exchange rates; exchange rates as well as tradable and non-tradable sectors; exchange rates, agricultural and manufacturing sectors; remittances and Dutch disease: empirical evidence, remittances and exchange rate; overvalued exchange rate and implications for tradable as well as non-tradable sectors of the economy; Dutch disease and the competitiveness of agricultural and manufacturing sectors; as well as Dutch disease and labour supply/unemployment to agricultural and manufacturing sectors.

Econometric models were built with specified behavioural equations capturing the important linkages among the variables of interest to test the various aspects of the Dutch disease effects of remittances. A bouquet of estimation techniques was employed to estimate the models.

8.3. SUMMARY OF MAJOR FINDINGS

An examination of exchange rates in the 1980s revealed that remittances and exchange rates were low and did not vary much. For the 1990s, both variables started experiencing gradual increases, while the decade of the 2000s has been characterised by a surge in remittances and exchange rates in Nigeria. This suggests high correlation between these two variables and an indication that as remittances increase, the exchange rate also increases. This study conducted an empirical analysis of the effects of remittances on Nigeria’s exchange rate. Using an error correction model (ECM) and data covering 1980 to 2015, this study explored the empirical evidence regarding the impact of remittances on the real exchange rate in Nigeria.

Our findings suggest that remittance inflows have a negative effect on the real exchange rate and the effect was found to be the same with other capital flows. This implies that in the long run an increase in remittance inflows causes the real exchange rate to decrease, thereby leading to a depreciation of the domestic currency, the naira, while an increase in the other capital flows; that is, foreign aid, foreign direct investment, and foreign private investment, causes the real exchange rate to decline and hence contributes to an appreciation of the domestic currency.

This study highlights how the various capital inflows affect the real exchange rate in Nigeria. It is imperative that monetary and fiscal policies in Nigeria enhance the financial infrastructure that will facilitate seamless inflow of remittances as a veritable alternative source of capital inflow into the country. Beyond the use of remittances for domestic needs of recipient families, innovative schemes should also be instituted to unlock the economic potential of these inflows for investment in the local economy.

The findings of the empirical study on the effect of remittances on the exchange rate suggest that remittance inflows have been associated with a rise in the real exchange rate in Nigeria. This implies that high remittance inflows have exerted a depreciating pressure on Nigeria's currency, the naira. Thus, contrary to the Dutch disease proposition, high remittance inflows into Nigeria have not resulted in an over-valued exchange rate but a low-valued exchange rate.

The results further suggest that, unlike foreign aid, increased inflow of remittances does not have a negative effect on the exchange rate. Increase in foreign aid has been associated with an appreciation of Nigeria's exchange rate. This study underlines the relative safety of remittance inflow over official foreign aid as a source of capital inflow into Nigeria.

On the linear relationship between remittances and real effective exchange rate and the impact of remittances and exchange rate on tradable and non-tradable sectors in Nigeria, the finding of the study is that remittances influence the performance of tradable agriculture, the manufacturing sector and the merchandise export sector in agreement with the Dutch disease idea. Also, we found evidence that changes in exchange rate act as a channel of the impact of Dutch disease on all sectors. Therefore, it can be deduced that real exchange rate appreciation leads to loss of merchandise export competitiveness in Nigeria. The findings emanating from the study's ECM suggest that remittances have not had significant positive effects on either services or trade, which constitute the non-tradable sector. Our results show that remittances have resulted in a reduction in the contribution of the service sector to total GDP.

Furthermore, the results emanating from the impulse response and variance decompositions provide insight on the links between remittances and the non-tradable sector in Nigeria. Specifically, remittances constitute more than 50 per cent of non-own forecast error in both the service and trade model. In addition, both the trade and service sector responded positively to a shock in remittances over the tenth period horizon, thus suggesting that remittances influence the non-tradable sector in Nigeria.

Our cointegration results show that a long-run relationship does not exist between remittance and competitiveness of the agricultural sector whereas a long-run relationship exists between remittance and manufacturing sector competitiveness. Furthermore, our results reveal that in Nigeria, remittances erode competitiveness in the agricultural sector whereas they stimulate manufacturing sector competitiveness. Our result on the effect of remittance on the competitiveness of the agricultural sector is consistent with Scott et al. (1990) and Lartey et al. (2012). The observed effect was linked to the labour loss associated with remittance inflow as well as unproductive use of remittance by those receiving remittance.

We found that in Nigeria remittances inflow enhances the competitiveness of the manufacturing sector. This is contrary to the findings of Lartey (2012) that remittances contribute to the loss of the competitiveness of the manufacturing sector in developing countries. As evident in our study, remittances inflow boosts the competitiveness of the sector. The observed effect can be attributed to the role of remittances in providing the foreign exchange required to purchase inputs, since the sector is import dependent for its input. Even though this is against the a priori expectation, the findings are supported by the study of Adams (2007), which explains the possibility of remittances having positive effects on the tradable sector. The significance and negative sign of the ECT implies that after a shock in the short run, the economy adjusts to its long-run equilibrium even though at different speeds of adjustment. The findings therefore reveal that remittances do not exert Dutch disease effects on the tradable sectors of the Nigerian economy. In fact, remittances have a positive effect on the tradable sector, hence more inflow of remittances should be encouraged into the country

8.4. POLICY IMPLICATION OF RESULTS

In Nigeria, remittances have an immense potential to stimulate growth and this might motivate some policy institutions to channel their resources to strengthen growth in this sector. It is imperative that monetary and fiscal authorities in Nigeria enhance the financial infrastructure that will facilitate seamless inflow of remittances as a veritable alternative source of capital inflow into the country.

Beyond the use of remittances for domestic needs of recipient families, innovative schemes should also be instituted to unlock the economic potential of these inflows for investment in the local economy. There is a need for the government of Nigeria to leverage on remittance inflows to issue diaspora bonds to finance public investments. However, to leverage on the potentials of these alternative revenue sources, government needs to seek to reduce the remittance costs (which decreases the volume of remittances), increase the flexibility and transparency of the commercial banks, and enforce policies that promote financial inclusion of the large unbanked population.

Remittances have assumed a considerable proportion in the composition of capital flows into Nigeria. Unlike Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI), the motivation for remitting money home is mostly patriotism and familial bonds with households in the recipient economy. Thus, remittance inflows are countercyclical; the senders are often committed to assisting receiving households to smoothen consumption, especially during periods of economic bursts.

Although remittances, like other capital flows, can lead to the appreciation of the domestic currency, an increase in remittance inflows causes the real exchange rate to decrease. It exerts a positive impact on the competitiveness of the agriculture and manufacturing sectors of the economy. With these sectors accounting for over 70 percent of employment and employment intensity output growth, the government needs to formulate and implement policies aimed at channelling remittances to the productive sector. Meticulous emphasis should be paid to all the processes that will facilitate the absorption of remittances to the economy. Remittances can serve as a veritable source of foreign exchange required for investment in agriculture and manufacturing in Nigeria.

In addition, huge remittance inflows necessitate the formulation of policies to accentuate the continuous engagement of the diaspora community, in specialised products and services targeted at the teeming diaspora population to meet their investment preferences. A policy framework to derisk investments would minimise low investor confidence that could arise from information asymmetry. Further, government agencies need to be positioned to remove institutional constraints hindering the full exploitation of the potential of remittances in the growth and development of the Nigerian economy.

8.5. LIMITATIONS AND SUGGESTIONS FOR FURTHER STUDY

There is a need to examine whether the findings can be established in similar developing countries in Africa. In the literature, remittance has been examined in the light of its effect on poverty (Adams & Cuecuecha, 2013) and human capital formation (Ngoma & Ismail, 2013); its role as a source of development finance (Chami et al., 2005) as well as its impact on the competitiveness of the economy (Bayangos & Jansen, 2011; Naceur et al., 2012). In terms of its effect on the competitiveness of the economy, it has largely been examined regarding its effect on the real exchange rate. An appreciation of the real exchange rate as a result of remittance inflow is regarded as a loss of competitiveness. The effect of remittance on the competitiveness of the decomposition of the GDP is rarely examined. The study by Lartey et al. (2012), which examined the effect of remittance on the competitiveness of the agricultural and the manufacturing sectors pooled several developing countries together. Further

studies on the effects of remittance inflows on competitiveness of the real sector in other African countries can be conducted.

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APPENDIX 1:

A SURVEY OF RELATED STUDIES ON REMITTANCES AND DUTCH DISEASE EFFECTS

	Study/Author(s)	Country(s) covered	Period Covered	Variables Used	Estimation Method	Methodology Issues	Summary of findings
1	The Impact of Remittances of International Migrants On the Standard of Living of The Left-Behind Families in Turkey Koc and Onan (2001)	Turkey-Europe Corridor	1975-2000	Level of education, Unemployment, Migrants as a Share of Population, Remittances as a share of GDP	Ordinary Least Squares		Remittances were found to have positive impact on household welfare. Remittance receiving households were found to be better off than those of non-remitting households.
2	Workers' Remittances and the Real Exchange Rate: A Paradox of Gifts Amuedo-Dorantes, C. & Pozo (2004)	Latin America and Caribbean Countries	1978-1998	Real exchange rate, Workers' remittances, Foreign Aid, Technological growth, Government expenditures, Terms of trade. World real interest rate ,	Ordinary Least Squares (OLS)	Endogeneity issues	The study found that while private gifts-remittances – do lead to exchange rate appreciation, public gifts – foreign aids do not have significant impact on the exchange rate.
3	Workers' Remittances and the Real Exchange Rate: A Paradox of Gifts Amuedo-Dorantes and Pozo (2004)	Latin America and Caribbean Countries	1978-1998	Real exchange rate, Workers' remittances, Foreign Aid, Technological growth, Government expenditures, Terms of	Ordinary Least Squares (OLS)	Endogeneity issues	The study found that while private gifts-remittances – do lead to exchange rate appreciation, public gifts – foreign aids do

				trade. World real interest rate ,			not have significant impact on the exchange rate.
4	Migration Remittances and Development: A Review of Global Evidence Page, J. and Plaza, S. (2006)	OECD – SOUTH EAST ASIA CORRIDOR	1990-2008	Remittances as a share of GDP, Black Market/Official Exchange Rate, Share of population with Secondary School Education.	Ordinary Least Squares	Non availability of Data for some Countries	There exists positive linkages between remittances and welfare of migrant family members at home. Children in Remittance receiving households have more schooling years and better heath access.
5	Emigrants' Remittances and Dutch Disease in Cape Verde Bourdet and Falck (2006)	Cape Verde	1977-2001	Real exchange rate. Ratio of net private transfer to GDP. Ratio of net ODA to GDP. Ratio of net private transfer and net ODA to GDP. International terms of trade. Ratio of exports and imports to GDP.	Cointegration and Error Correction Model		The study showed that remittance have adverse effects on the real exchange rate and the competitiveness of the tradable sector in Cape Verde.
6	Making Remittances Work for Africa. Gupta et al. (2007)	76 Developing Countries	1975-2004	Remittances, FDI Exports, Real Exchange Rates, Capita Income, Income Inequality As Measured By	Country surveys		The study showed that remittances promote financial deepening in the region, after controlling for macroeconomic and institutional

				The Gini Index;			variables that are commonly used to explain financial development in low-income countries
7	Increasing the Macroeconomic Impact of Remittances on Development Ratha, Mohapatra & Xu (2008)	India China and Mexico	2007	Remittances as a percentage of GDP, GDP	Cross Sectional Qualitative Analysis		The study found that Remittances are economically significant in reducing poverty of households in Remittance recipient countries.
8	DO REMITTANCES IMPACT THE ECONOMY? SOME EMPIRICAL EVIDENCES FROM A DEVELOPING ECONOMY. Mallick (2008)	India	1963-2003	Private Consumption, Income/Output Rate of Interest, Remittances Openness Measure, Private Investment, Gross Private Capital Formation.	Dynamic Ordinary Least Square	All data not available	The study showed and adverse effect of remittance leads to increase in private investment and output growth. Increase in remittances leads to increase in private consumption and not productive investment
9	Remittances and the Dutch Disease Acosta, Lartey and Mandelman (2009)	El Salvador	1990-2012	Consumption, Investment, Tradable, Non Tradable sector, GDP, Aggregate Remittances.	Dynamic Stochastic General Equilibrium Model (The Bayesian	The identification problems of reduced form models	The study found that remittance flows enhances welfare of recipients by increasing consumption. This leads to higher

					Estimation Technique)		tradable prices which reallocates labour to the non tradable sector.
10	Impact of Remittances on Poverty and Financial Development in Sub-Saharan Africa. Gupta, Pattillo and Wagh (2009)	Sub Saharan African Countries	1975-2005	Remittances, Official Aid FDI Exports, Real Exchange Rates, Capita Income, Income Inequality As Measured By The Gini Index;	Three-stage least squares estimation technique		The study found that size of countries appear unrelated to financial development but that remittances are a significant as a determinant of financial development.
11	Do Workers' Remittances Promote Economic Growth? Barajas, Chami and Fullenkamp, (2009)	A panel of 84 Remittance Recipient Country	1970-2004	M2 to GDP, per Capita GDP, Remittances, GDP Growth	Ordinary Least Squares (OLS) and Fixed Effects Instrumental Variables Regressions	Endogeneity Issues	The study results showed that economic growth is not impacted by workers' remittances
12	Effect of Remittances on Poverty and Financial Development in Sub-Saharan Africa Gupta et al. (2009)	Sub Saharan African Countries	1975-2004	Ratio of M2 to GDP, Ratio of Bank Depositors to GDP, Per Capital GDP, Schooling and Distance	Three stage Least Squares Estimation Technique	Bias in the estimates due to endogeneity between remittance financial	The study found that although there exists reverse causality between remittances, financial development and poverty; remittances

						development and poverty	have poverty mitigating effects and facilitate financial development.
13	Remittances, Institutions, and Economic Growth. Catrinescu et al. (2009)						
14	The Determinants of International Remittances in Developing Countries. Adams (2009)	76 Low and Medium Income Countries	1995-2001	Distance from labor-sending country to main remittance-sending region, Language,, Poverty headcount (Percent of population under 14 years, Gini coefficient Real interest rate (percent) , _Cost to send $200 remittances, Exchange rate	Instrument Variable Approach	There is the possibility of reverse causality. This may lead to the problem of biased results.	The study found that remittances to recipient countries are inversely related to the level of education of the migrants. Countries which export low-skilled labour receive more remittances than the ones sending high-skilled labour.
15	Impact of Remittances on Economic Growth and Poverty. Javid, Arif and Qayyum (2010).	Pakistan	1973-2007	Gross Domestic Product (GDP), Remittances, Gross Fixed Capital Formation Human Development Index (HDI) , Poverty (Headcount Ratio) and Income Inequality	Autoregressive Distributive Lag (ARDL)		The study found that remittances have positive and significant effects on economic growth and poverty reduction in Pakistan

16	Dealing with Dutch Disease Brahmbhatt, Canuto and Vostroknutova (2010)			M2 to GDP, per Capita GDP, Remittances, GDP Growth			
17	Do international remittances cause Dutch disease? Beja (2010)	Low Income Countries (Bangladesh, Brazil, China P.R., Colombia, Dominican Republic, Egypt, El Salvador, Guatemala, India, Mexico, Morocco, Pakistan, Philippines) High Income Countries (Australia, China P.R., France, Germany, Portugal, Spain, United Kingdom, United States)	1984-2008	Tradable sector, on-tradable sector, International remittances as a share of the GDP, a vector of macroeconomy indicators.	Seemingly Unrelated Regression procedure		The study found that the absence of production structures in Low Income Countries predisposes them to contracting the Dutch Disease. Developed domestic production structure helps High Income Countries to realise more valuable tradable sector production to compete for every unit of importation.

18	Remittances and Dutch Disease: A Dynamic Heterogeneous Panel Analysis on the Middle East and North Africa Region. Fayad (2010)	Middle East and North Africa (MENA)	1980-2005	Remittance Inflows, Remittance Outflows, Real Exchange Rate, Foreign Direct Investment, Oil Export	Dynamic Pooled Mean Group (PMG) Estimator.	There is the possibility of error of cross sectional dependence	The MENA region attracts a large pool of labour migrants. The study found that although remittances cause exchange rate appreciation in the region, the effect is largely attenuated by the productivity-enhancing nature of the depreciative effect of remittance outflows
19	Are remittances a stabilising factor in the Mexican economy? Mendoza and Calderon (2010)	Mexico	2005-2008	Remittances, GDP, FDI			The study found that remittances have a positive effect on economic growth and the business cycle in Mexico.
20	Diaspora Bonds as a New Funding Vehicle for Developing Countries Ketkar and Ratha (2010)	India and Israel	1953-2007	Cost of registration, Bond Sales and yield rates	Qualitative Analysis	Data and facts on diaspora bonds are difficult to gather.	Israel has developed a very rich menu of diaspora- focused investment options making Diaspora Bonds a veritable asset class. Diaspora Bonds offerings are a rich source of development finance. However, India raises Diaspora

							Bonds occasionally as an alternative external inflows when international capital markets are difficult to access.
21	Remittances and the Dutch Disease in Sub-Saharan Africa: A Dynamic Panel Approach Kemegue et al. (2011)	Sub-Saharan Africa	1980-2008	Remittances as a % of GDP, FDI as a % of GDP, Terms of Trade (TOT), Trade Openness.	Generalised Method of Moments (GMM) and Feasible Generalised Least Squares (FGLS)	FGLS used in the study produces upward biased standard errors	The study found a reverse causality between remittances and real exchange rate. Dutch disease is transmitted through overdependence on imported products arising from low levels of local production and not through loss of export competitiveness
22	Remittances and banking sector breadth and depth: Evidence from Mexico Demirgüç-Kunt et al. (2011)	Mexico	2000	Branches per capita, Accounts per capita, Deposits to GDP, Credits to GDP, Branches	Panel Data Analysis	Potential endogeneity of remittances	The study found that remittances flows promote banking depth and depth. Remittances are statistically and economically significantly depth, increasing the number of branches and accounts per capita and the

							amount of deposits to GDP
23	Impact of Workers' Remittances on Financial Development in Nigeria Oke, Uadiale and Okpala (2011)	Nigeria	1997-2009	M2/GDP(proxy for financial development), Remittances, GDP the degree of openness, dual exchange rates regimes, the ratio of credit to private sector to GDP	Ordinary Least Square Estimation (OLSE) technique and the Generalized Method of Moments (GMM) estimator	Model Adequacy issues as shown by the diagnostic tests	The study showed that remittances significantly and positively impact financial development in Nigeria. It further found that remittances often fund consumption more that productive activities
24	Remittances and Competitiveness: The Case of the Philippines Bayangos and Jansen (2011)			M2/GDP (proxy for financial development), Remittances, GDP the degree of openness, dual exchange rates regimes, the ratio of credit to private sector to GDP.			
25	Remittances and the Dutch Disease in Sub-Saharan Africa: A Dynamic Panel Approach Kemegue, Van Eyden and Owusu-Sekyere (2011)	Sub-Saharan Africa	1980-2008	Remittances as a % of GDP, FDI asa % of GDP, Terms of Trade (TOT), Trade Openness,	Generalised Method of Moments (GMM) and Feasible Generalised Least	FGLS used in the study produces upwardbiased standard errors	The study found a reverse causality between remittances and real exchange rate. Dutch disease is transmitted through overdependence on imported products arising from low levels of local

					Squares (FGLS)		production and not through loss of export competitiveness
26	We who are Strangers: Insights into how Diasporic Nigerians Experience Bereavement Loss Eke, Eke, Okafor, Ezebialu and Ogbuagu (2011)						
27	Remittances, Exchange Rate Regimes and the Dutch Disease: A Panel Data Analysis Lartey et al. (2012)	109 Developing and Transition Countries	1990–2003	Remittances as a % of GDP, FDI as a % of GDP, Terms of Trade (TOT), Trade Openness	Generalised Method of Moments (GMM) Distributed lag	Disaggregating the output along sectoral lines, and tradable / non tradable ratio made it possible to disentangle nominal exchange rate effects on the real exchange rate in the analysis of Dutch Disease effects	The study found that rising levels of remittances to recipient countries have spending effects and resource movement effects. The spending effect leads to exchange rate appreciation and the resource movement effects favour the non tradable sector at the expense of the tradable sector. These are associated with the Dutch Disease.

28	Dutch Disease and Nigeria Oil Economy Onwumere, Ibe and Ugbam (2012)	Nigeria	1975-2000	GDP, Oil Export, Manufacturing Production, Real Exchange Rate	Ordinary Least Squares	The model did not account fixed effects	The Study found that foreign exchange receipts from oil export have weakened local productive capacity and exerted pressures leading to current appreciation.
29	Remittances, financial development and economic growth in Africa. Nyamongo, Misati, Kipyegon & Ndirangu (2012)	36 African Countries	1980-2009	Growth rate of real GDP per capita, real GDP per capita; the ratio of gross investment to GDP; inflation rate, human capital formation; ratio of government consumption to GDP and openness variable (sum of exports and imports to GDP).	Two-Stage Least Squares (TSLS) instrumental variables method	Endogeneity bias	The study found that there is a negative impact of remittances on growth but complementary to financial development in African Countries. It further revealed that financial development is not of strong importance as far as economic growth is concerned.
30	Remittances and the Dutch Disease: Evidence from Cointegration and Error-Correction Modelling. Ratha (2013)	China, India, Lesotho, Mexico and Philippines	1975-2011	Real Effective Exchange Rate, Remittance Inflows (% Of GDP), Trade-Share (Average Of Exports And Imports As % Of GDP), Net FDI Inflow	Cointegration and Error-Correction Model		The study found remittances to be a major inflow of foreign exchange with high likelihood of causing the domestic currency to appreciate and hurt

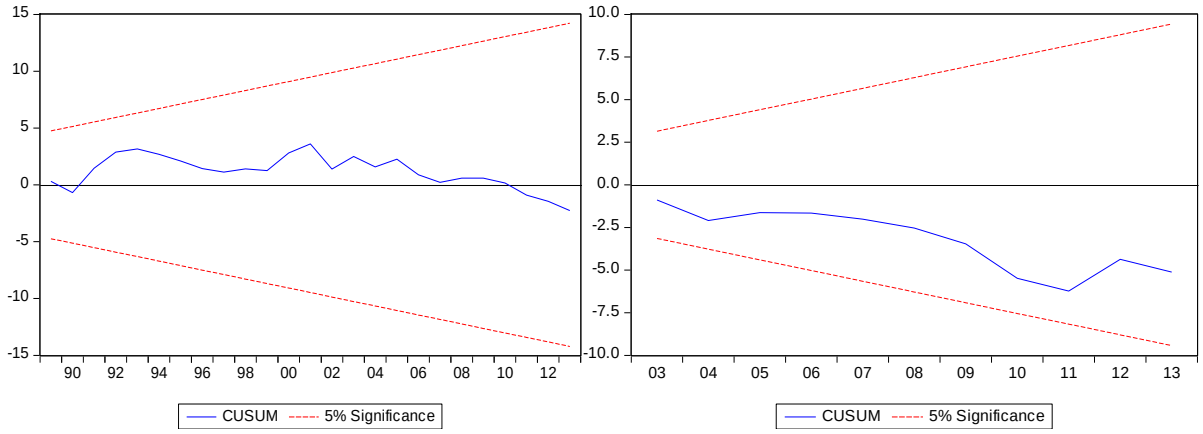
				(% Of GDP), Terms of Trade, Government policy			export of locally produced goods
31	Macroeconomic impact of remittances and the Dutch Disease in a developing Country. Rabbi et al. (2013)	Bangladesh	1975-2005	Trade openness, technological progress (TECP) and the nominal variables, money supply	Johansen cointegration and Vector Error Correction models		The study found that increase in the flow of remittances has lowered external trade competitiveness and an appreciation of the exchange rate in Bangladesh. This trend is slowly bringing about a deterioration of the Bangladeshi economy in the long run.
32	REMITTANCES, DUTCH DISEASE, AND COMPETITIVENESS: A BAYESIAN ANALYSIS Makhlouf and Mughal (2013)	Pakistan	1980-2008	Foreign Direct Investments, Official Development Assistance Trade Openness As A Share Of GDP, Public Expenditure To GDP, Productivity. Besides, M2 Growth	Bayesian Analytical Method	There is limitation on the availability of number of observations, and potential endogeneity issue	The study found that remittance inflows from the Persian gulf causes Dutch disease in Pakistan.. It further showed the existence of spending and resource movement effects in Pakistan , both in the short and Long run

33	Remittances for Financial Access: Lessons from Latin American Microfinance. Ambrosius, Fritz and Siegler (2014)	The Dominican Republic, El Salvador and Mexico	2000-2010	Financial access (share of adults using formal financial services). Remittances as a share of GDP, Domestic Credit as a share of the GDP.	Qualitative Analysis		The study found ong correlation ween remittances and nership of Savings count. Remittances epen access to mestic credit
34	The Macroeconomic Impact of Migrant Remittances Suresh and Setterfield (2014)	South Africa and Lesotho	1998-2006	Growth rate of SA per capita real GDP, Growth rate of Lesotho per capita real GDP, Growth rate of real per capita remittances.	Ordinary Least Squares	The model ignored the effects of other countries	The study showed that remittances are influenced by the economic prospects in the host and the recipient countries.
35	Remittances and Financial Sector Development. Lessons from The Salvadoran Case. Ambrosius (2016)	El-Savadour	2007-2010	Number of accounts per 1000, Deposit per capita, Level of Education and Poverty	Ordinary Least Squares and Heckman Selection Model (TOBIT)	The sample size is too short	The study found that El Salvadorian municipalities that have large number of remittance receivers have better access to banking services and higher monetary savings than non-receivers. . This results suggests that remittances are not only expended for daily consumption but that part of it saved.
36	Remittances and financial development in Sub-Saharan	19 Sub-Sahara Africa Countries	1980-2010	Remittances as (% of GDP), M2 (% of GDP) Credit (% of GDP), GDP	Seemingly Unrelated		The results of the study showed that remittances promote

	African countries: A system approach. Coulibaly, Gnimassoun and Mignon (2018)			per capita, (Constant 2000 USD)	Regressions (SUR) systems		financial development in Sub Saharan countries while financial development has no impact on remittances in any country.

APPENDIX 2:
VARIANCE DECOMPOSITION FUNCTION, IMPULSE RESPONSE AND DISAGGREGATED ECM RESULTS

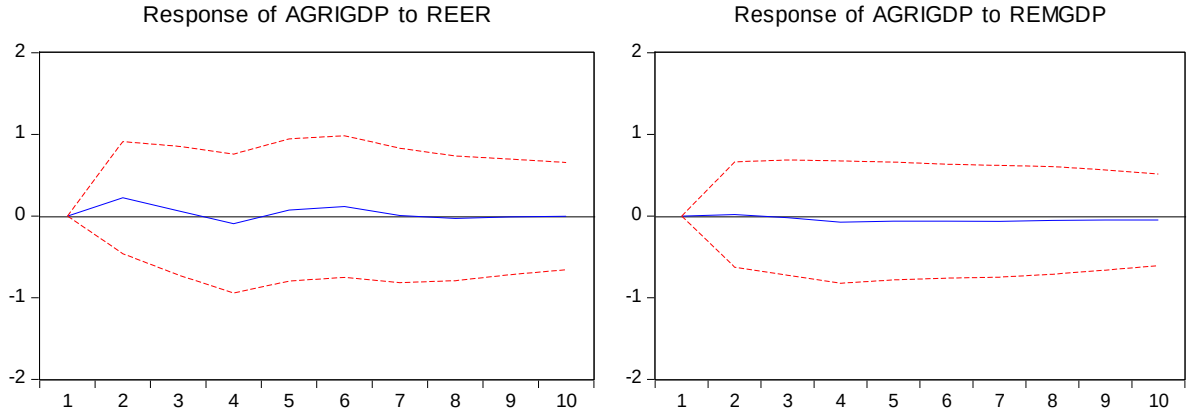
Impulse response



(a) Agriculture (b) Industry

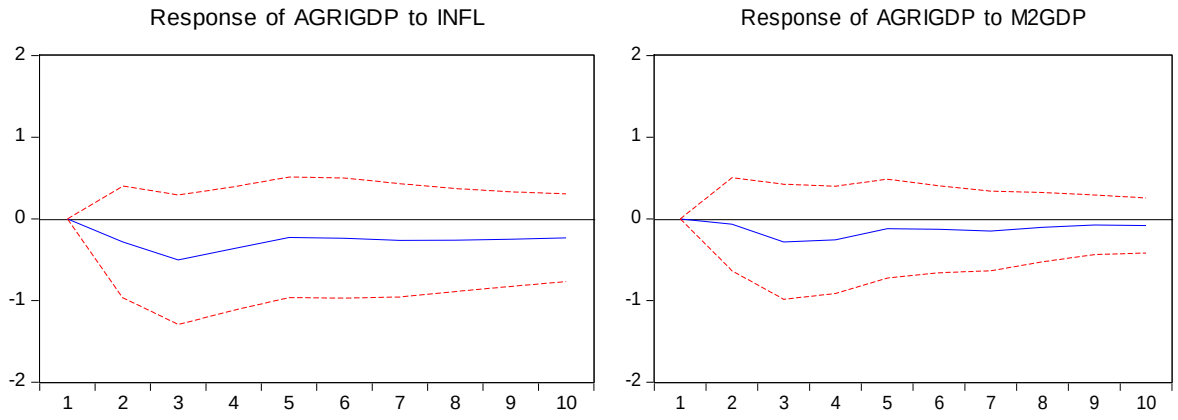
Agriculture

Response to Cholesky One S.D. Innovations ± 2 S.E.Response to Cholesky One S.D. Innovations ± 2 S.E.



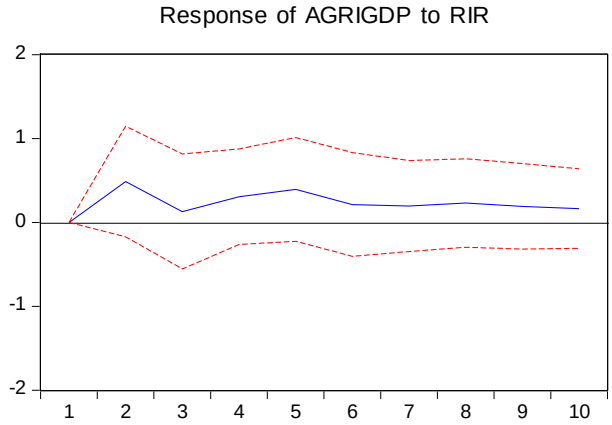
(a) (b)

Response to Cholesky One S.D. Innovations ± 2 S.E.Response to Cholesky One S.D. Innovations ± 2 S.E.



(c) (d)

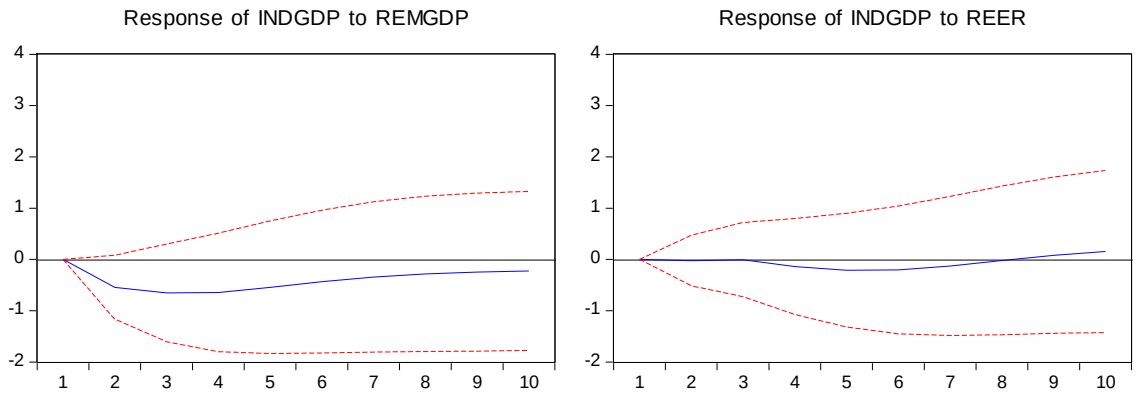
Response to Cholesky One S.D. Innovations ± 2 S.E.



(e)

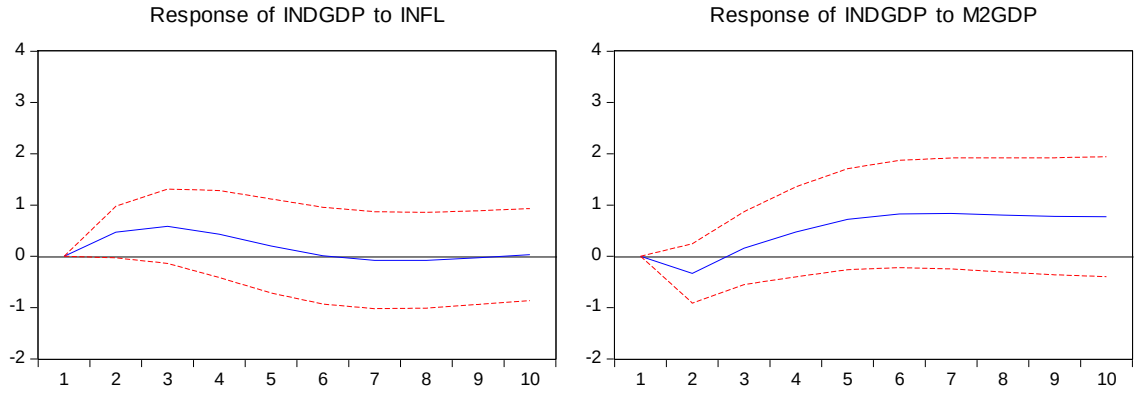
Industry

Response to Cholesky One S.D. Innovations ± 2 S.E.Response to Cholesky One S.D. Innovations ± 2 S.E.



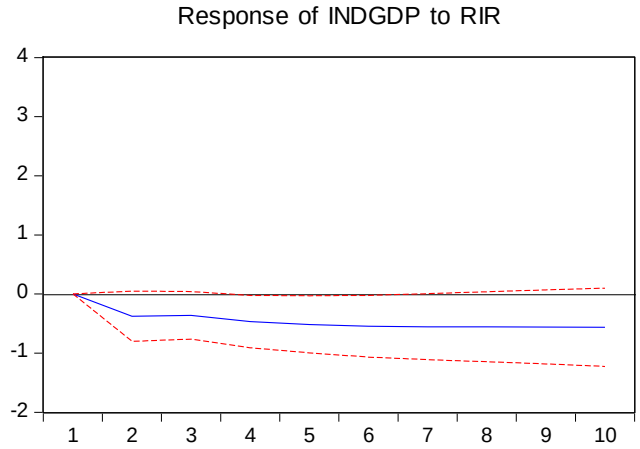
(a) (b)

Response to Cholesky One S.D. Innovations ± 2 S.E.Response to Cholesky One S.D. Innovations ± 2 S.E.



(c) (d)

Response to Cholesky One S.D. Innovations ± 2 S.E.



(e)

Variance decomposition

(a) Agriculture

Period	AGRIGDP	REMGDP	REER	INFL	M2GDP	RIR
1	100.000	0.000	0.000	0.000	0.000	0.000
2	90.677	0.007	1.253	2.014	0.111	5.939
3	85.581	0.014	1.075	6.619	1.675	5.036
4	82.696	0.106	1.052	7.803	2.532	5.811
5	81.478	0.150	0.998	7.593	2.430	7.351
6	81.497	0.191	1.075	7.594	2.412	7.230
7	81.303	0.230	0.992	7.856	2.496	7.124
8	80.830	0.251	0.944	8.183	2.472	7.319
9	80.520	0.270	0.903	8.502	2.421	7.386
10	80.312	0.281	0.869	8.750	2.400	7.388

(b) Industry

Period	INDGDP	REMGDP	REER	INFL	M2GDP	RIR
1	100.000	0.000	0.000	0.000	0.000	0.000
2	87.231	4.897	0.009	3.665	1.841	2.357
3	81.138	8.040	0.006	6.260	1.516	3.040
4	77.266	9.374	0.164	6.172	2.983	4.042
5	74.865	9.172	0.413	5.052	5.663	4.835
6	73.532	8.355	0.550	4.072	8.064	5.427
7	73.014	7.472	0.530	3.421	9.719	5.843
8	72.972	6.714	0.456	2.961	10.740	6.157
9	73.070	6.096	0.422	2.603	11.395	6.415
10	73.116	5.585	0.444	2.325	11.889	6.640

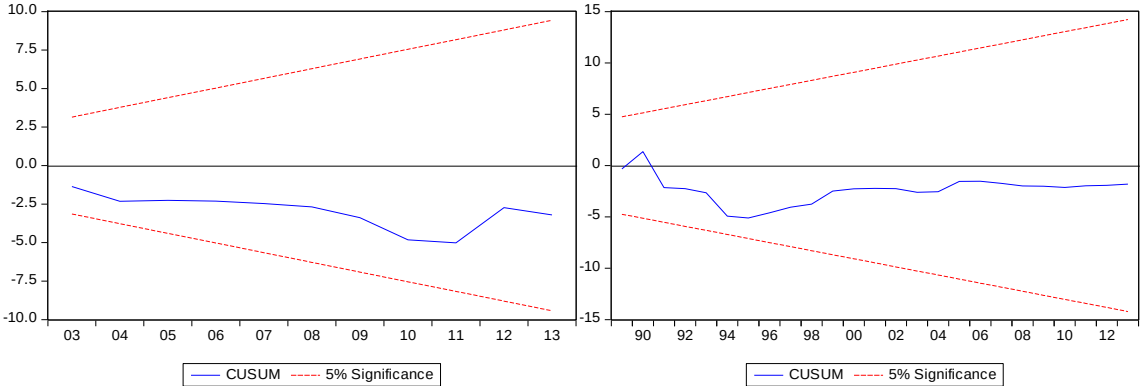
Disaggregated analysis by sector

Agricultural sector

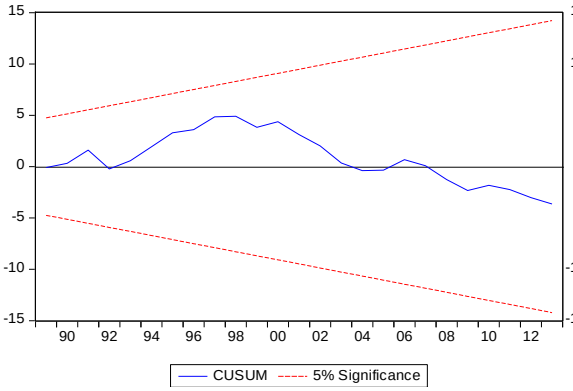
Variable	Crop	Fishing	Forestry	Livestock
	Coefficient (standard error)	Coefficient (standard error)	Coefficient (standard error)	Coefficient (standard error)
Short-run				
Constant	-7.155*** (0.194)	-0.002 (0.013)	-0.006 (0.006)	-0.012 (0.020)
ΔREMGDP	0.065** (0.025)	-0.004 (0.004)	-0.002 (0.002)	-0.004 (0.009)
ΔREER	-0.239 (0.341)	0.013 (0.044)	-0.003 (0.015)	0.005 (0.055)
ΔM2GDP	0.004 (0.018)	0.001 (0.002)	-0.003** (0.001)	0.007 (0.005)
ΔRIR	-0.002 (0.004)	0.000 (0.000)	-0.000 (0.000)	-0.002 (0.001)
ΔINFL	0.002 (0.007)	-0.000 (0.0001)	0.000 (0.000)	0.001 (0.0001)
ECT(-1)	-0.154*** (0.049)	-0.419** (0.200)	-0.293** (0.110)	-0.189* (0.095)
Long-run				
Constant	31.951*** (3.288)	0.565*** (0.174)	0.025 (0.075)	1.375*** (0.358)
REMGDP	0.575*** (0.106)	-0.003 (0.003)	-0.015*** (0.004)	-0.053*** (0.011)

Variable	Crop	Fishing	Forestry	Livestock
	Coefficient (standard error)	**Coefficient (standard error)**	**Coefficient (standard error)**	**Coefficient (standard error)**
REER	-1.667*** (0.595)	-0.007 (0.033)	0.061*** (0.013)	0.162** (0.063)
M2GDP	-0.057 (0.049)	-0.001 (0.002)	0.004** (0.001)	0.009 (0.005)
RIR	0.001 (0.027)	0.001 (0.001)	-0.001 (0.001)	-0.001 (0.004)
INFL	-0.042* (0.022)	-0.001 (0.001)	0.001 (0.001)	0.004 (0.003)
Diagnostics				
R-Squared	0.845	0.217	0.300	0.219
D-W	1.891	1.372	1.815	0.948
Normality	0.003	0.119	0.000	0.000
Breusch-Godfrey Serial Correlation LM Test	0.816	0.050	0.600	0.014
Heteroskedasticity test: ARCH	0.109	0.024	0.943	0.725
CUSUM test	Stable	Stable	Stable	Stable

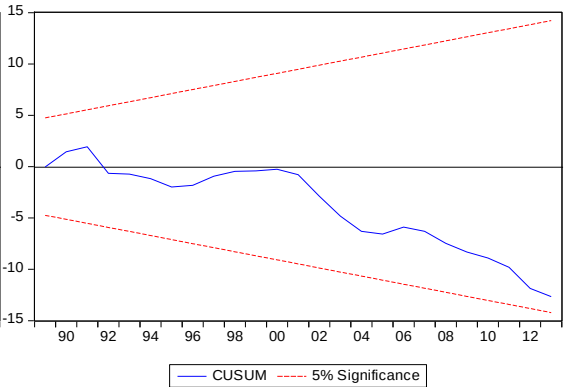
CUSUM test



(a) Crop production (b) Fishing



(c) Forestry

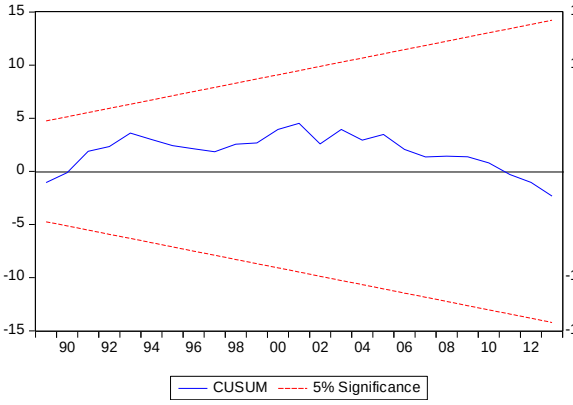


(d) Livestock

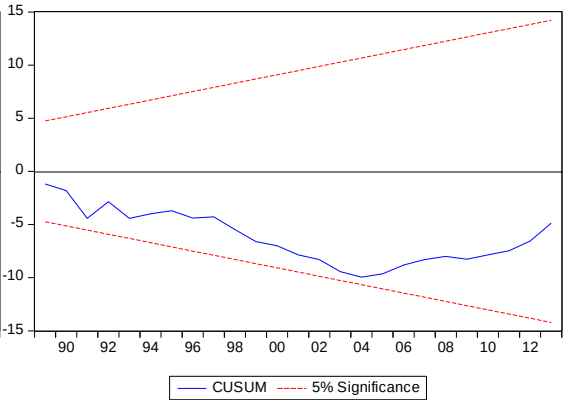
Variable	**Crude petroleum and Natural gas**	**Manufacturing**	**Solid Minerals**
	Coefficient (standard error)	**Coefficient (standard error)**	**Coefficient (standard error)**
Short-run			
Constant	-0.710* (0.356)	-0.057 (0.166)	-0.008* (0.004)
ΔREMGDP	0.029 (0.051)	-0.043 (0.073)	-0.002 (0.001)
ΔREER	0.063 (0.594)	-0.351 (0.039)	0.021** (0.010)
ΔM2GDP	-0.163*** (0.055)	0.007 (0.039)	0.002** (0.001)
ΔRIR	0.039** (0.019)	0.006 (0.009)	-0.0004* (0.0001)
ΔINFL	-0.009 (0.021)	0.004 (0.011)	-0.0005*** (0.0001)
ECT(-1)	-0.174 (0.163)	-0.355* (0.173)	-0.326*** (0.079)
Long-run			
Constant	57.502*** (5.287)	5.631** (2.089)	-0.218** (0.080)
REMGDP	0.215 (0.190)	-0.203*** (0.050)	-0.011*** (0.003)
REER	-2.099** (0.878)	0.287 (0.367)	0.061*** (0.016)
M2GDP	-0.354*** (0.056)	0.051** (0.023)	0.005*** (0.001)
RIR	0.084*** (0.028)	-0.003 (0.012)	-0.0007* (0.001)
INFL	0.022 (0.034)	0.015 (0.010)	-0.0009 (0.001)

Variable	Crude petroleum and Natural gas	Manufacturing	Solid Minerals
	Coefficient (standard error)	Coefficient (standard error)	Coefficient (standard error)
Diagnostics			
R-Squared	0.250	0.196	0.378
D-W	2.121	1.841	1.601
Normality	0.620	0.543	0.002
Breusch-Godfrey Serial Correlation LM Test	0.737	0.251	0.536
Heteroskedasticity test: ARCH	0.473	0.237	0.842
CUSUM test	Stable	Stable	Stable

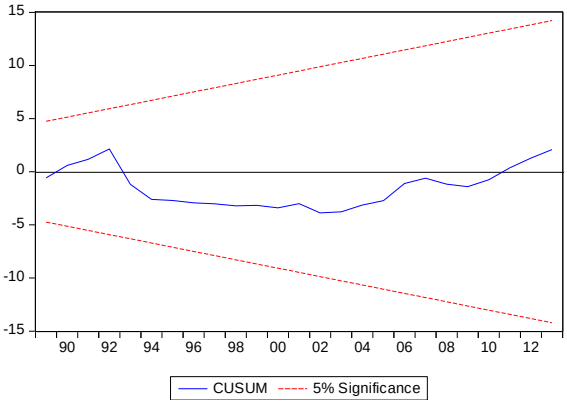
CUSUM test



(a) Crude petroleum and natural gas



(b) Manufacturing



(c) Solid Minerals